

Longitudinal Full-Length 16S rRNA Gene Profiling of the Canine Gut Microbiome: Impact of Age, Diet, Birth Mode, and Reproductive Stage

Ph.D. Thesis

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LIST OF PUBLICATIONS

Scientific paper included in the thesis

1. **Asaduzzaman Md**, Oláh Péter, Yaseen Natheer Jameel, Taifi Ahmed, Járay Tamás, Gulyás Gábor, Boldogkői Zsolt, Tombácz Dóra[✉]

Longitudinal long-read microbiome profiling in a canine model reveals how age, diet, and birth mode shape gut community dynamics

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Publications not related to the thesis

1. Ali Nurshad[✉], Sumon Abu Hasan, Fariha Khandaker Atkia, **Asaduzzaman Md**, Kathak Rahanuma Raihanu, Molla Noyan Hossain, Mou Ananya Dutta, Barman Zitu, Hasan Mahmudul, Miah Rakib, Islam Farjana

Assessment of the relationship of serum liver enzymes activity with general and abdominal obesity in an urban Bangladeshi population

SCIENTIFIC REPORTS (2045-2322): 11 1 Paper 6640. 9 p. (2021)

Journal subject: Scopus - Multidisciplinary Rank: D1

Citing papers: 44 | Independent citation: 31 | Self citation: 13

2. Ali Nurshad[✉], Rahman Sadaqur, Islam Shiful, Haque Tangigul, Molla Noyan Hossain, Sumon Abu Hasan, Kathak Rahanuma Raihanu, **Asaduzzaman Md**, Islam Farjana, Mohanto Nayan Chandra, Hasnat Mohammad Abul, Nurunnabi Shaikh Mirja, Ahmed Shamim[✉]

The relationship between serum uric acid and lipid profile in Bangladeshi adults

BMC CARDIOVASCULAR DISORDERS (1471-2261 1471-2261): 19 1 Paper 42. 7 p. (2019)

Journal subject: Scopus - Cardiology and Cardiovascular Medicine Rank: Q2

Citing papers: 105 | Independent citation: 84 | Self citation: 21

Record of Scientific Conferences

Since the beginning of my PhD studies in September 2021, I have contributed to a total of 12 conference posters. I served as the first-presenting author on 7 posters and as a contributing author on an additional 5 posters presented at international and national scientific conferences and workshops. All conference records are documented in my ORCID profile <https://orcid.org/0000-0003-0434-8517>.

ABBREVIATIONS

CMDI: Canine Microbiota Dysbiosis Index

gDNA: Genomic DNA

DIN: DNA Integrity Number

HTS: High-Throughput Sequencing

ONT: Oxford Nanopore Technologies

PacBio: Pacific Biosciences

BCS: Bükki Cserfes

DMD: Duna-menti Dumás

SRT: Serteperti

PPA: Pattogó Parázs

RRT: Rezerta-Réti

LPL: Le Petit Lapin

BARF: Biologically Appropriate Raw Food

HPLC: High-Protein-Low-Carbohydrate

HPMC: High-Protein-Moderate-Carbohydrate

MPHC: Moderate-Protein-High-Carbohydrate

FEDIAF: European Pet Food Industry Federation

NMDS: Non-metric Multidimensional Scaling

CONs: Co-Occurrence Networks

SD: Standard Deviation

bp: Base Pair

μl: Microliter

fmol: Femtomole

mm: Millimeter

s: Second

min: Minute

1. INTRODUCTION

1.1. Gut

The gastrointestinal (GI) tract comprises a coordinated system of organs that enables digestion and nutrient uptake while maintaining constant interactions with resident microbial communities. Extending from the mouth to the anus, it comprises multiple anatomically and functionally specialized compartments that collectively process dietary inputs and eliminate waste. In microbiome research, the term “gut” is commonly used to refer to the lower gastrointestinal tract, particularly the intestinal segments that harbor dense and diverse microbial communities comprising trillions of microorganisms, which play important roles in host health and disease¹.

1.2. Gut Microbiome

The term *gut microbiota* describes the collection of microorganisms residing in the gastrointestinal tract, including bacteria, archaea, fungi, and protists, whereas the *gut microbiome* additionally incorporates associated viruses, phages, plasmids, and other mobile genetic elements^{2,3}. Furthermore, the collective genomes and genes of all members of microbiome are defined as the metagenome². The gut microbiome has been proposed as a functional ‘new organ’ essential for host survival⁴, exerting its effects through the production of diverse metabolites that influence intestinal health and multiple extra-intestinal organs⁵. In dogs, the gut microbiome has also been associated with key functional traits, influencing olfactory performance as well as behavioral and working outcomes, including motivation, aggression, and sociability^{6,7}.

A well-functioning gut microbiome consists of a stable yet adaptable microbial community that interacts closely with the host, and the maintenance of this equilibrium is strongly linked to both health and disease. The healthy dog gut microbiome is dominated by major bacterial phyla, including *Firmicutes*, *Bacteroidetes*, *Fusobacteria*, *Proteobacteria*, and *Actinobacteria*^{8,9}. Dysbiosis describes a state in which the normal equilibrium of the gut microbial community is disturbed, involving shifts in microbial composition, diversity, functional potential, and metabolite profiles; in canine, such imbalances have previously been quantitatively assessed using the canine microbiota dysbiosis index (CMDI)¹⁰. In dogs, dysbiotic alterations have been associated with diarrheal and irritable bowel–type disorders, obesity, congestive heart failure, chronic kidney disease, gastric dilatation–volvulus, behavioral disorders, infectious diseases, and Crohn’s disease^{11–16,9,17}.

1.3. Canine Model

According to Wozencraft, canines, which belong to the family *Canidae*, form a distinct monophyletic lineage within the order *Carnivora*, comprising only extant species classified under the subfamily *Caninae*¹⁸. Species within the family *Canidae* exhibit characteristic anatomical features, including an elongated cranial morphology with a narrow rostrum, a highly developed olfactory system, and carnivoran dentition marked by prominent canines and functional carnassials that enable efficient processing of diets containing both animal and plant-derived components. The family includes a wide variety of species with global distribution, ranging from domestic dogs to wild taxa such as wolves, foxes, jackals, and coyotes. In Wozencraft's classification, more than thirty extant canine species are recognized, highlighting the group's extensive geographic range, ecological flexibility, and shared morphological characteristics within *Carnivora*¹⁸.

Domestic dogs (*Canis lupus familiaris*) represent a valuable comparative and translational model in microbiome research, as they share key physiological traits, dietary responses, and environmental exposures with humans¹⁹. Furthermore, comparative analyses have shown that the canine gut microbiome more closely resembles the human microbiome than those of commonly used laboratory models, such as pigs or mice, particularly with respect to gene content and responses to diet²⁰. In our study, we examined fecal samples from the Hungarian Pumi breed. The Pumi is a medium-sized herding breed originating in Hungary, developed between the 17th and 18th centuries through the crossbreeding of native Puli dogs with imported German and French terrier-type herding breeds²¹. Recent genomic studies have demonstrated that the Pumi possesses a distinct genetic profile among Central European herding breeds, reflecting targeted historical selection for agility, working performance, and environmental adaptability²².

1.4. Major Factors Influencing Canine Gut Microbiome Composition

The canine gut microbiome is influenced by multiple interacting intrinsic factors, including age, physiological state, pathology, and host genetics, as well as extrinsic factors such as diet, environmental exposure, and medication use, all of which contribute to microbial community development and host health. Studies in growing dogs indicate that the maturation of the gut microbiota is modulated by maternal influences, environmental conditions, and host-specific factors²³. In adult dogs, previous studies have likewise identified age, diet, genetic background,

environmental context, and physiological status as important contributors to gut microbiome composition⁸.

1.4.1. Age

Age is a key biological determinant that influences the composition, functional potential, and stability of the gut microbiome throughout the lifespan. Previous studies have demonstrated that the canine gut microbiome, similar to that of humans, exhibits age-associated variation in both microbial diversity and abundance²⁴⁻²⁷. Advancing age is associated with pronounced changes in both the gut microbiome and the immune system²⁸; however, their causal interrelationship remains unresolved²⁹. Chronic low-grade systemic inflammation, often referred to as inflammaging, is widely recognized as a characteristic feature of the aging process³⁰. Several studies report that aging is associated with gut microbiota dysbiosis accompanied by increased circulating inflammatory markers^{31,32}. Although numerous studies have examined gut microbiota in children, our understanding of gut microbiome development in puppies, particularly from a longitudinal perspective, remains limited. In dogs, early life is characterized by rapid gut microbiota maturation, during which predominantly anaerobic bacterial taxa progressively establish prior to adulthood⁹. These microbial communities play a crucial role in maintaining host health and development, as disturbances in their composition may lead to metabolic imbalances.

Early models of mammalian development proposed that the fetal intestinal tract is sterile, with microbial colonization occurring only after birth³³. However, continuously accumulating molecular evidence has challenged the debatable “sterile womb” hypothesis, as the emergence of advanced molecular techniques has enabled the detection of microbial DNA in the placenta, amniotic fluid, and meconium of healthy foetuses^{34,35}. In light of these findings, it is now suggested that initial microbial exposure may begin in utero^{34,35}. Despite these observations, the presence and biological relevance of a prenatal microbiome remain debated, as microbial signals detected in low-biomass fetal environments may arise from contamination rather than stable colonization^{33,34,36}. Gut microbiomes and their associated genes may be transmitted across generations through both vertical and horizontal routes, with maternal transmission occurring during birth, lactation, and close postnatal contact³⁷. This transmission may involve microbial genes, i.e., microbiomes, without necessarily including identical microbial species³⁷.

1.4.2. Delivery Mode

Mode of delivery, including vaginal birth and cesarean section, is a key determinant of early-life gut microbiome establishment. Studies in dogs have detected microbial DNA in amniotic fluid and meconium from puppies delivered by both vaginal birth and cesarean section, suggesting that early microbial exposure may vary with birth mode^{38,39}. In humans, numerous studies have shown that delivery mode markedly affects early gut microbial colonization patterns and diversity^{40–43}, while maternal microbial transmission is proposed to occur via several pathways, including parturition, breastfeeding, and close postnatal contact³⁷. By contrast, comparatively few studies in dogs have investigated the specific effects of cesarean versus vaginal delivery on early gut microbiome development, particularly using longitudinal study designs^{36,38,39}.

1.4.3. Reproductive Stages

Reproductive stages such as pregnancy, the peripartum period, and lactation are characterized by pronounced physiological and metabolic changes that may alter gut microbiome composition. In humans, longitudinal studies have demonstrated gestation-associated alterations in the maternal gut microbiome, including trimester-specific changes in microbial diversity and community structure^{44,45}. These patterns are thought to arise from dynamic host–microbe interactions that contribute to metabolic adaptation and immune regulation during pregnancy and may extend into the postpartum period. In dogs, available evidence is more limited; however, studies indicate that neonatal gut colonization occurs rapidly following birth⁴⁶. Moreover, investigations of maternal fecal, vaginal, and colostrum microbiotas around parturition suggest that maternal microbial communities may contribute to early-life microbial exposure and neonatal outcomes⁴⁷. Nevertheless, few longitudinal studies have systematically characterized gut microbiome dynamics across pregnancy and lactation in female dogs. Consequently, the influence of reproductive stage–specific physiological changes on the maternal gut microbiome, as well as their implications for offspring colonization and long-term health, remains incompletely understood.

1.4.4. Diet

Diet plays a central role in shaping the composition and functional potential of the gut microbiota. Although dogs evolved from carnivorous ancestors and typically perform well on protein-rich diets, they display marked dietary adaptability and are capable of utilizing diverse food sources. The majority of canine gut microbiome studies to date have focused on animals-

fed extruded kibble diets, which are generally characterized by relatively high carbohydrate content and dominate the commercial dry dog food market. In response to increasing interest in alternative feeding practices, industrial formulations have been developed that include kibble with reduced carbohydrate and elevated protein content, as well as frozen or freeze-dried raw meat-based diets^{48,49}. Within the gastrointestinal tract, dietary substrates are transformed by gut microbial communities into a range of metabolites with the capacity to modulate host physiological processes, and changes in microbial composition may therefore alter intestinal metabolite profiles⁵⁰. Metagenomic comparisons across mammals, including humans, demonstrate that the canine gut microbiome is more similar to the human microbiome than to those of mice or pigs in both gene content and dietary responsiveness⁴⁸. Martínez-López et al. proposed that modifying dietary protein and fiber content could enable targeted modulation of the canine gut microbiota, highlighting its potential therapeutic relevance⁵¹. Nevertheless, several questions remain unresolved, including the identification of dietary patterns that best support a healthy canine gut microbiome, optimal ranges of individual dietary components, and the metabolic fate of these nutrients within the gut⁵²⁻⁵⁴.

1.4.5. Environment

Environmental conditions represent key extrinsic determinants influencing the composition and developmental trajectory of the canine gut microbiome. Housing conditions, social context, and shared environmental exposures affect microbial community structure by regulating contact with external microbial sources. Longitudinal studies suggest that dogs living within shared environments increasingly exhibit similar gut microbiota profiles over time, consistent with convergence driven by common environmental exposure. For example, in a controlled cohort of military working dog puppies, sustained exposure to shared housing and training environments was associated with increasing similarity of the gut microbiome among littermates during maturation, accompanied by stabilization of community structure at later developmental stages⁵⁵.

Environmental influences appear to exert particularly strong effects on gut microbiome development during early life. A longitudinal cohort study of Labrador Retriever puppies demonstrated that gut microbiota composition is shaped by environmental exposures during growth, including contact with other animals and household-related factors, highlighting the role of the immediate living environment in microbial development⁵⁶. Despite these influences, the canine gut microbiome demonstrates a degree of resilience, with core bacterial taxa

persisting across environmental changes and inter-individual variation contributing to overall community diversity^{55,56}. Collectively, these findings indicate that environmental factors, particularly housing conditions and shared exposures during early life, play a significant role in shaping the canine gut microbiome. However, the extent to which early-life and long-term environmental influences interact with host genetics and physiology to determine adult gut microbiome composition remains incompletely understood. Nevertheless, few longitudinal investigations have directly compared dogs of the same breed or littermates raised under distinct kennel environments, highlighting a critical gap in our understanding of how environmental and host-related factors jointly shape the gut microbiome.

1.4.6. Genetics

Host genetic background constitutes a key intrinsic determinant contributing to variation in canine gut microbiome composition. Studies performed under controlled dietary and environmental conditions have shown that dogs from different breeds harbor distinct gut microbial communities, indicating a measurable influence of host genetic background on microbiome structure⁵⁷. Breed-associated differences have been observed at both the phylum and genus levels, with consistent variation in the relative abundance of key taxa among breeds matched for age and body weight⁵⁷. Despite pronounced inter-breed variability, a conserved set of core gut microbial taxa has been identified among healthy dogs, suggesting that fundamental microbial functions are maintained while host genetics influences the relative abundance of specific taxa⁵⁸. Additional support for a genetic contribution to gut microbiome composition comes from studies of the highly inbred Norwegian Lundehund, in which reduced host genetic diversity was associated with marked microbiome dysbiosis, whereas reintroduction of genetic variation through outcrossing was linked to a shift toward a more balanced microbial community⁵⁹. Breed-related microbial signatures have been observed across dogs differing in age and body condition, indicating that breed-associated host characteristics contribute to gut microbiome variation in conjunction with other host factors⁶⁰. Moreover, genetic variation in immune-related genes has been associated with differences in gut microbiome composition and disease susceptibility, as demonstrated in Great Danes with gastric dilatation–volvulus, where specific risk alleles were linked to distinct microbial profiles¹⁴. Taken together, available evidence indicates that host genetic background plays a meaningful role in structuring the canine gut microbiome. Nevertheless, the contribution of genetic effects relative to other extrinsic and intrinsic drivers, such as housing conditions and developmental stage, has not been fully resolved. However, the manner in which breed- and kennel-associated genetic

characteristics interact with host development and environmental exposures to influence microbial succession over time remains insufficiently characterized, underscoring the need for longitudinal study designs that integrate host genetics with environmental and developmental variables.

1.5. Evolution of Microbiome Research

1.5.1. From Classical Microbiology to Culture-Independent Microbiome Science

Early investigations in microbiology were largely based on culture-dependent methods designed to isolate and characterize individual microorganisms, with particular emphasis on pathogenic taxa. Subsequent work revealed that culture-based approaches recover only a small subset of existing microbial diversity, as a large proportion of microorganisms occupying host-associated and environmental niches cannot be readily cultivated using conventional laboratory protocols^{61,62}.

Awareness of these constraints prompted a conceptual transition toward culture-independent strategies capable of interrogating microbial communities directly within their native environments. The application of nucleic acid-based molecular techniques revealed that microbial communities are considerably more diverse and structurally complex than previously assumed, and that they play essential roles in host physiology and disease processes. Collectively, these advances laid the foundation for modern microbiome research, which adopts a community-level framework to investigate host-microbe interactions and their implications for health and disease⁶³⁻⁶⁵.

1.5.2. High-Throughput Sequencing and the Expansion of Microbiome Research

Following the transition toward culture-independent investigation of microbial communities, the introduction of high-throughput sequencing (HTS) technologies markedly expanded microbiome research by enabling large-scale, parallel characterization of microbial assemblages across diverse biological and environmental systems. Through the parallel generation of large sequencing datasets, HTS methodologies uncovered previously unrecognized microbial diversity and enabled systematic analyses of microbiome composition and its associations with host health and disease⁶⁶⁻⁶⁸. In addition to applications in human health, HTS technologies have expanded microbiome research into agricultural and food-related systems, offering insights into plant-associated microbiomes, fermentation processes, and food safety⁶⁹⁻⁷². Together, these advances positioned HTS as a core technological driver of modern microbiome research and provided the technical basis for subsequent improvements in

study design, sequencing resolution, and integrative analytical frameworks now widely applied in the field.

1.5.3. Advances in Sequencing Resolution: Full-Length 16S rRNA Profiling

With the widespread adoption of high-throughput sequencing in microbiome research, limitations in taxonomic resolution became increasingly evident. Early microbiome studies primarily employed short-read sequencing platforms, such as Illumina, which typically target specific hypervariable regions of the 16S rRNA gene (e.g., V1–V2 or V3–V4). However, partial 16S rRNA gene sequences frequently lack sufficient phylogenetic signal to reliably distinguish closely related species—and, in some cases, ecologically distinct lineages—within the same genus, thereby limiting taxonomic resolution and biological interpretation^{73–75}. This limitation hampers the identification of functionally—and in some cases clinically—relevant taxa that differ at the species level, particularly in health- and disease-associated microbiome studies^{76,75}. Large-scale benchmarking and *in silico* analyses have further demonstrated that short-read sequencing of individual 16S rRNA variable regions is inherently limited in its ability to capture the species and strain-level diversity that can potentially be achieved through sequencing of the complete ~1.5 kb 16S rRNA gene⁷⁷.

These constraints motivated the adoption of third-generation sequencing technologies, including Oxford Nanopore Technologies (ONT) and Pacific Biosciences (PacBio), which enable sequencing of near-complete or full-length 16S rRNA genes. By capturing the entire gene, full-length 16S rRNA profiling substantially improves taxonomic resolution and facilitates more accurate species and strain-level classification compared with short-read approaches^{58,78,79}. Comparative analyses using mock communities and host-associated samples have shown that full-length sequencing can detect bacterial taxa that are frequently misclassified or entirely missed when only partial 16S regions are analysed, with particularly pronounced effects in taxonomically complex gut-associated genera such as *Bacteroides*^{80,81}.

Improved taxonomic resolution is especially relevant for complex gut microbiomes, including those of dogs and humans, where closely related microbial species may differ substantially in ecological function or host association. Studies applying ONT or PacBio platforms to fecal samples have consistently reported richer and more taxonomically resolved microbial community profiles compared with Illumina-based short-read sequencing, highlighting the value of long-read approaches for detailed microbiome characterization^{58,79,82}. Cross-platform benchmarking studies indicate that long-read amplicon data generally show improved species-level agreement with shotgun metagenomic profiles compared with short-read 16S approaches,

although platform-specific biases related to sequencing chemistry, error profiles, and library preparation persist^{77,82,83}.

Despite these advantages, sequencing outcomes remain influenced by upstream methodological factors, including DNA extraction protocols, primer selection, and library preparation strategies, all of which can substantially affect microbial representation and downstream taxonomic inference. Recent benchmarking efforts have demonstrated that upstream methodological factors—including DNA extraction procedures and, in particular, primer and library design—can account for a substantial proportion of variability in observed microbial community profiles, in some cases matching or exceeding the influence of biological covariates such as individual identity or sampling time in canine datasets^{83,84}. Inefficient lysis of Gram-positive taxa, differential recovery of high-molecular-weight DNA, and region- and platform-specific amplification biases have been identified as major contributors to methodological variability in microbiome profiling, underscoring the importance of methodological consistency when applying high-resolution sequencing approaches^{74,83–85}. These observations underscore that both sequencing strategy and upstream methodological choices influence taxonomic resolution and microbial community profiles, particularly at the species level. Although shotgun metagenomics enables functional profiling, full-length 16S rRNA sequencing represents a cost-effective and scalable strategy for achieving high taxonomic resolution in large longitudinal microbiome studies.

1.5.4. Reference Databases and Bioinformatic Frameworks

Accurate interpretation of microbiome sequencing data depends strongly on the quality and completeness of reference databases used for taxonomic assignment and downstream analyses. Widely used bacterial 16S rRNA reference databases, including SILVA, Greengenes, and the Ribosomal Database Project (RDP), have been central to microbiome research; however, recent comparative evaluations have identified limitations related to inconsistent nomenclature, incomplete annotations, and database-dependent variation in taxonomic resolution that can affect downstream interpretation of microbial community profiles^{86,87}. Comparative benchmarking studies further demonstrate that database choice can substantially influence inferred microbial community structure and diversity metrics, particularly at genus and species levels, underscoring the importance of reference selection in microbiome analyses^{88,89}. To address these challenges, curated and integrative resources such as GSR-DB—which harmonizes Greengenes, SILVA, and RDP within a unified taxonomic framework—have been

developed to improve taxonomic consistency and enhance species-level classification accuracy across microbiome studies⁸⁶.

Recent methodological advances have further emphasized the value of high-resolution and ecosystem-specific reference databases in conjunction with full-length 16S rRNA sequencing. Tools such as EMU, specifically designed for species-level profiling of full-length 16S rRNA gene data generated by Oxford Nanopore sequencing, leverage curated reference collections and probabilistic classification strategies to improve taxonomic resolution and reduce misclassification in complex microbial communities⁹⁰. These advances are complemented by mature bioinformatic frameworks within the R statistical environment, where packages such as phyloseq⁹¹ support standardized integration of taxonomic, phylogenetic, and metadata; phylogenetic relationships can be visualized using tools such as iTOL, while genus- and species-level clustering and heatmap-based analyses are commonly implemented using ComplexHeatmap⁹². Collectively, the use of curated reference databases in combination with flexible and reproducible bioinformatic frameworks provides a robust foundation for high-resolution and statistically sound microbiome research.

1.5.5. Relevance to the Present Thesis

Within this evolving scientific landscape, longitudinal high-resolution microbiome profiling provides a robust framework for characterizing gut microbiome dynamics over time. In the present thesis, this framework is implemented using full-length 16S rRNA gene sequencing to enable species-level resolution across multiple biological and environmental dimensions. When applied to a biologically relevant model such as the dog, this approach allows systematic investigation of how intrinsic and extrinsic factors shape gut microbial communities longitudinally. The conceptual and methodological developments outlined above therefore form the foundation of this thesis, which examines canine gut microbiome dynamics in relation to age, diet, birth mode, and reproductive status.

2. AIMS AND OBJECTIVES

The overall aim of this study was to investigate longitudinal gut microbial community dynamics in purebred Hungarian Pumi dogs using full-length 16S rRNA gene sequencing and to quantify the relative contribution of major host- and environment-related determinants to microbial community assembly.

The specific objectives were as follows:

- 1) To characterize age-associated maturation of the gut microbiome from birth through adulthood, including diversity dynamics and taxonomic succession.
- 2) To identify developmental ecological breakpoints, particularly during the weaning transition and associated dietary shifts.
- 3) To quantify and compare the influence of age, diet, kennel environment, litter, and host sex on microbiome diversity and composition.
- 4) To define and compare the species-level core microbiome across developmental stages.
- 5) To assess age-related remodeling of microbial co-occurrence network structure.
- 6) To determine the impact of delivery mode (cesarean section versus vaginal birth) on early postnatal microbiome composition.
- 7) To characterize reproductive stage-associated variation in the maternal gut microbiome across pregnancy and lactation.

3. MATERIALS AND METHODS

3.1. Experimental Animals and Feeding Protocols

The primary study population comprised 84 healthy purebred Hungarian Pumi dogs obtained from six dedicated breeding kennels in Hungary, each housing exclusively this breed. The cohort included 55 puppies originating from 12 vaginally delivered litters, their dams ($n = 9$), and an additional 20 adult male and female dogs serving as adult control animals. Puppies were monitored longitudinally from birth until 81 weeks of age. Neonatal puppies were initially housed indoors in cradles, whereas growing puppies were raised in mixed indoor–garden environments. Adult dogs were maintained in comparable house–garden settings, resulting in broadly similar environmental conditions across kennels. The mean age of dams was 4.3 ± 1.6 years (mean \pm SD), while adult control dogs had a mean age of 5.9 ± 3.6 years (mean \pm SD). The breeding kennels included in the study were coded as BCS (Bükki Cserfes), DMD (Dunamenti Dumás), SRT (Serteperti), PPA (Pattogó Parázs), RRT (Rezerta-Réti), and LPL (Le Petit Lapin). (see **Table 1**).

A separate subgroup consisting of five puppies (10 samples in total; two samples from each puppy) delivered by cesarean section from a single litter in the Le Petit Lapin kennel was also included. These puppies were born to the same dam that had previously produced vaginally delivered offspring. This subgroup was analyzed independently and was not included in the primary cohort summarized in **Table 1**. Details of the cesarean-section puppies are provided in **Table 2**, and the metadata used for the analyses are available in [Supplementary Data 6](#).

Kennel ID	Number of litters	Number of puppies			Number of unique mothers	Mothers' age (years [mean \pm SD])	Number of adult female controls	Number of adult male controls	Control adults' age (years [mean \pm SD])	Samples per kennel
		Total	Female	Male						
BCS	2	7	3	4	2	3.9 \pm 1.6	2	0	3.2 \pm 2.5	61
DMD	4	20	13	7	2 ^a	4.5 \pm 3.2	0	1	6.8	114
SRT	2	4	1	3	1 ^b	4.2	3	4	6.2 \pm 1.9	80
PPA	1	7	2	5	1	6.0	4	3	7.9 \pm 4.6	46
RRT	2	12	5	7	2	4.0 \pm 1.8	1	1	1.8 \pm 0.1	100
LPL	1	5	3	2	1 ^c	4.1	0	1	1.8	45
Total	12	55	27	28	9	4.3 \pm 1.6	10	10	5.9 \pm 3.6	446

Table 1: Primary Study population summary by kennel. **a.** Indicates that both mothers gave birth twice during the study period. **b.** Refers to a case where the second mother was not sampled during gestation/lactation and is therefore excluded from the maternal age calculation. **c.** Denotes that this mother later delivered an additional litter by cesarean section, which is summarized separately in Table 2. The Mean age of adult control dogs was calculated at the time of first sample collection. For mother dogs, age was calculated at the time of parturition. Kennel IDs: BCS = Bükki Cserfes; DMD = Duna-menti Dumás; LPL = Le Petit Lapin; PPA = Pattogó Parázs; RRT = Rezerta-Reti; SRT = Serteperti.

Kennel ID	Number of litter	Number of puppies	Age group	Mothers' ID	Samples per Puppy	Total samples
LPL	1	5	8-10 weeks	Same as LPL 1 ^c	2	10

Table 2: Summary of the cesarean section (C-section) delivered puppy litter from kennel Le Petit Lapin (LPL). This litter was delivered via cesarean section by the same mother who also delivered a vaginal litter included in Table 1 (see **footnote 1^c**). These samples were analyzed separately and were excluded from the main cohort analysis presented in Table 1.

Puppies were exclusively breastfed until approximately 8 weeks of age, with solid food introduced at around 3.5 weeks alongside continued nursing. All dogs were primarily fed commercial dry diets; however, a subset of adult dogs from one kennel (Duna-menti Dumás) received a raw BARF diet. Diet categorization and nutritional composition followed the 2024 FEDIAF guidelines⁹³, and detailed dietary information is provided in **Supplementary Data 1**.

No dogs included in this study received antibiotic treatment within six months prior to their first sampling point or during the sampling period. Any animal requiring antibiotic therapy during the study would have been excluded from the cohort.

3.2. Study Samples

Stool samples for the primary cohort were collected longitudinally from dams during gestation, lactation, and post-lactation periods; from their offspring from birth through adulthood (up to 81 weeks of age); and from adult dogs included as control animals. Samples from the cesarean-section subgroup consisting of five puppies were available only for the 8–10 week age group, yielding a total of 10 samples (two samples per puppy). In total, 463 fecal samples were collected and sequenced, and the sequencing data were deposited in the European Nucleotide Archive under BioProject accession number [PRJEB82125](#). Of these, 446 samples from the primary cohort and all 10 samples from the cesarean-section subgroup were retained for downstream analyses. Seven samples were excluded at the downstream analysis stage (see [Supplementary Data 2](#) for accession numbers and exclusion criteria). These seven samples included one sample from a single puppy (SRTP_E_PM1_210921_Ezust1; sample accession: [ERS22560180](#)), which accounts for the difference between the 90 dogs archived in ENA BioProject [PRJEB82125](#) and the 89 dogs (main cohort plus cesarean-section subgroup) presented in this study.

All fecal samples were collected immediately after defecation using DNA/RNA Shield Fecal Collection Tubes (Zymo Research) and further stored at -80 °C until DNA extraction.

3.3. DNA Extraction

Genomic DNA (gDNA) was isolated from fecal samples using the ZymoBIOMICS™ 96 MagBead DNA Kit Dx (Zymo Research; Cat. No. D4308-E) in accordance with the manufacturer's guidelines. All extraction procedures were performed under sterile conditions in a Class II biosafety cabinet. Fecal samples were homogenized immediately prior to aliquoting, and DNA was subsequently extracted from the resulting aliquots using bead beating

followed by magnetic bead-based purification, as specified by the kit protocol. DNA concentration and integrity were assessed using a Qubit® 4 Fluorometer and an Agilent 4150 TapeStation, respectively (**Supplementary Data 3**). Purified gDNA was stored at -20 °C until library preparation.

3.4. 16S Library Preparation and Sequencing

Full-length 16S rRNA gene libraries spanning the V1–V9 regions were generated from high-quality genomic DNA ($DIN \geq 6$) using the Oxford Nanopore Technologies Rapid Sequencing Amplicons–16S Barcoding Kit (SQK-16S024), incorporating AMPure XP bead-based cleanup, in accordance with the manufacturer's instructions. Library yield and fragment size distribution (~1,500 bp) were evaluated using a Qubit® 4 Fluorometer and an Agilent 4150 TapeStation, respectively, prior to pooling (**Supplementary Data 3**).

Libraries were pooled in equimolar amounts and sequenced on an Oxford Nanopore MinION device using R9 flow cells (25 flow cells in total). Raw sequencing data were basecalled using Dorado v0.8.0 in super-accurate mode with a minimum Q score threshold of 10 before downstream processing. Information on library pooling per flow cell and sequencing read statistics is provided in **Supplementary Data 4**.

3.5. Bioinformatic Analysis

EMU v3.4.5 was used to generate read-count tables per taxon and calculate relative abundances following the workflow described previously^{90,94}. Taxon-level read count tables generated by EMU served as input for downstream analyses. Diversity metrics were computed using phyloseq⁹¹ v3.2 in R v4.2 based on unfiltered count data. Taxa were filtered and retained if they exceeded 5% relative abundance and were present in at least five samples. Compositional differential abundance testing across age groups, diet categories, kennels, reproductive states, and delivery modes was conducted using ANCOM-BC (ancombc R package) on the filtered count tables. The adjusted P-values (*P_{adj}*) reported in Results correspond to ANCOM-BC outputs.

To assess the effects of age, sex, kennel, kennel-by-litter, and major diet categories, mixed-effects models were fitted using the lme4 package. age was modeled both categorically and with splines to account for diet-age confounding. Major diet categories were defined as exclusive breast milk, breast milk plus starter kibble during the weaning period, post-weaning

commercial kibble diets (17 formulations collapsed into macronutrient-based groups following FEDIAF protein:carbohydrate guidelines), and adult BARF diets.

A taxonomic tree of the top 350 taxa was illustrated using iTOL⁹⁵. Genus-level hierarchical clustering and heatmaps were generated with ComplexHeatmap⁹². Microbial co-occurrence networks were constructed using SparCC (SpiecEasi) and visualized with igraph and Cytoscape⁹⁶. Comparative statistics (Wilcoxon rank-sum, Student's *t*-test, Mann–Whitney U-test) were performed as indicated in the figure legends, with $P < 0.05$ considered statistically significant unless otherwise stated.

3.6. Core Microbiome Definition and Visualization

Core microbiome sets were defined at the species level based on prevalence thresholds within each age group. A stringent cutoff ($\geq 90\%$ prevalence) was applied for the heatmap and Jaccard similarity analyses, whereas a more inclusive threshold ($\geq 80\%$ prevalence) was used for the UpSet plot to capture broader shared community members, following commonly adopted practices in microbiome research⁹⁷.

Heatmaps and Jaccard similarity indices were calculated from prevalence tables and overlaps among core microbial sets were visualized using an UpSet plot. All visualizations were conducted in Python (v. 3.12.3) using the pandas, numpy, and matplotlib libraries, with the UpSet representation generated through custom plotting code implemented in matplotlib.

DNA extraction, sequencing library construction, and the downstream bioinformatic workflow were conducted in accordance with current best-practice recommendations reported in recent benchmarking studies^{83,84}. Detailed methods are provided in [Supplementary Methods](#) section.

4. RESULTS

4.1. Key Findings Overview

Across the longitudinal cohort, age emerged as the dominant driver of gut community maturation, with a clear transition from early-life microbial profiles toward a more stable, adult-like composition over time, accompanied by increasing within-sample diversity. In parallel, dietary transitions were associated with reproducible changes in community structure and in the relative abundance of multiple taxa, indicating that nutrition modulates the developmental trajectory beyond age alone. A dedicated comparison of delivery mode (cesarean versus vaginal

birth) revealed measurable compositional differences during early life, suggesting that initial colonization conditions may leave detectable signatures during the neonatal period. Finally, reproductive status introduced transient but distinct microbiome shifts during pregnancy and lactation, after which the communities tended to return toward the individual baseline. Together, these findings highlight age as the primary axis of microbiome development, with diet, delivery mode, and reproductive status acting as secondary but biologically meaningful modifiers.

4.2. Study Design and Analytical Pipeline

In this study, longitudinal gut microbiome profiles were generated from 446 fecal samples obtained from 84 purebred Hungarian Pumi dogs as the main cohort. The cohort comprised 55 vaginally delivered puppies followed from birth until 81 weeks of age, nine dams sampled across pregnancy and lactation, and 20 time-matched adult control dogs. In addition, 10 samples from a small subgroup of five puppies (age window: 8–10 weeks) delivered by cesarean section from a single litter were analyzed separately.

Genomic DNA was extracted from all samples, and full-length 16S rRNA gene amplicons (V1–V9) were sequenced using the Oxford Nanopore MinION platform with R9 flow cells. Basecalling was performed using Dorado, and taxonomic profiles were generated using EMU. Diversity metrics were computed using phyloseq based on unfiltered read counts. Downstream R analyses applied prevalence and abundance-based filtering, retaining taxa with a relative abundance > 5% and presence in at least five samples. Mixed-effects models (lme4) were used to evaluate the effects of age, sex, kennel, kennel-by-litter, and diet categories defined according to FEDIAF guidelines, with age modeled both categorically and using spline terms to account for potential age–diet confounding. Comparative statistics included Wilcoxon rank-sum, Student’s t-, or Mann–Whitney U-tests, with $\alpha = 0.05$ considered significant unless otherwise indicated. Microbial community structure was summarized using hierarchical clustering and heatmaps (ComplexHeatmap), taxonomic tree visualization (iTOL), and SparCC-based co-occurrence network inference (SpiecEasi), visualized in igraph and Cytoscape (Fig. 1).

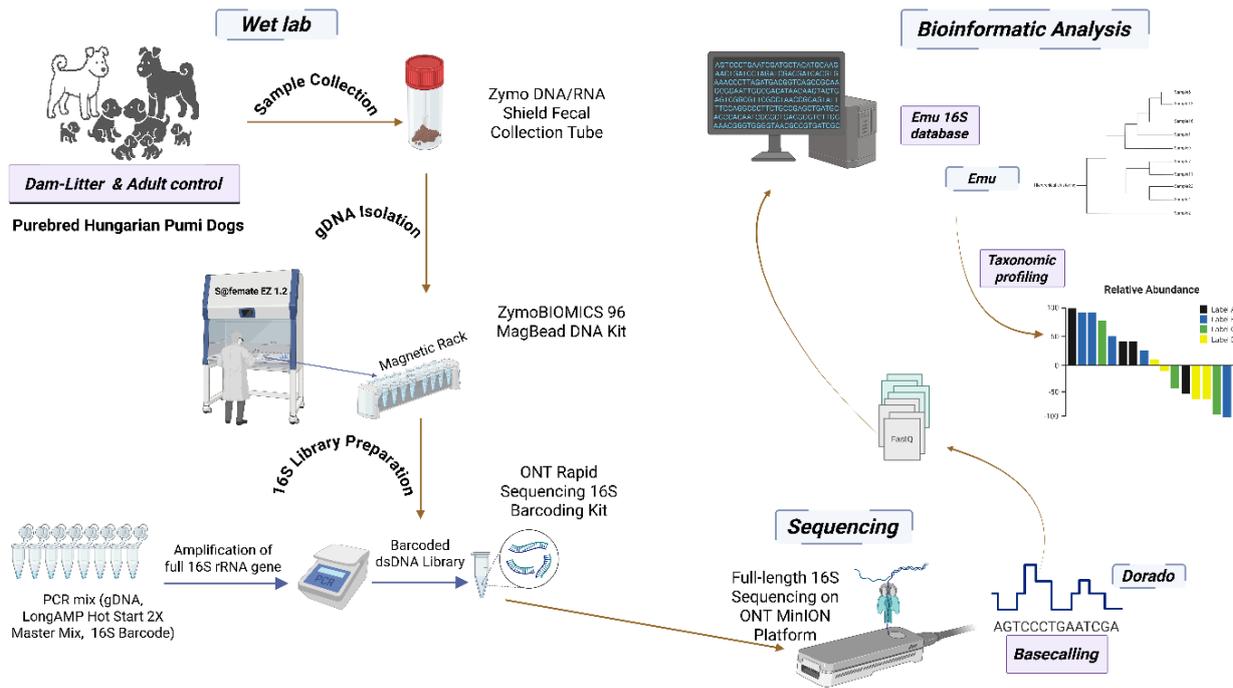


Figure 1: Graphical abstract of the study workflow. Fecal samples from purebred Hungarian Pumi dogs were processed for full-length 16S rRNA gene sequencing on the Oxford Nanopore MinION platform, followed by Dorado basecalling and taxonomic profiling with the Emu 16S database.

4.3. Sequencing Output

Across all sequencing runs, a total of 121.30 million high-quality reads ($Q \geq 10$) were generated. The mean sequencing yield per sample was $266,017.09 \pm 127,742.50$ reads (mean \pm SD). Reads had an average length of $1,521.81 \pm 50.07$ bp and a mean Q-score of 20.40 ± 1.05 . In total, approximately 185.01 GB of raw sequencing data were produced, providing sufficient sequencing depth and read length for reliable species-level taxonomic resolution.

4.4. Microbial Diversity Increases During Puppyhood but Stabilizes in Adulthood

Ordination of samples using non-metric multidimensional scaling (NMDS) revealed a clear age-associated gradient in gut microbiome composition (Fig. 2A). Samples collected during neonatal and early postnatal stages displayed substantial dispersion, indicating high inter-individual variability. In contrast, samples from later developmental stages clustered more tightly, consistent with progressive convergence toward a mature, adult-like microbiome configuration.

Alpha diversity, quantified using the Shannon index, increased rapidly during early life, with a marked rise observed during the weaning period (approximately 3.5–6 weeks of age). This

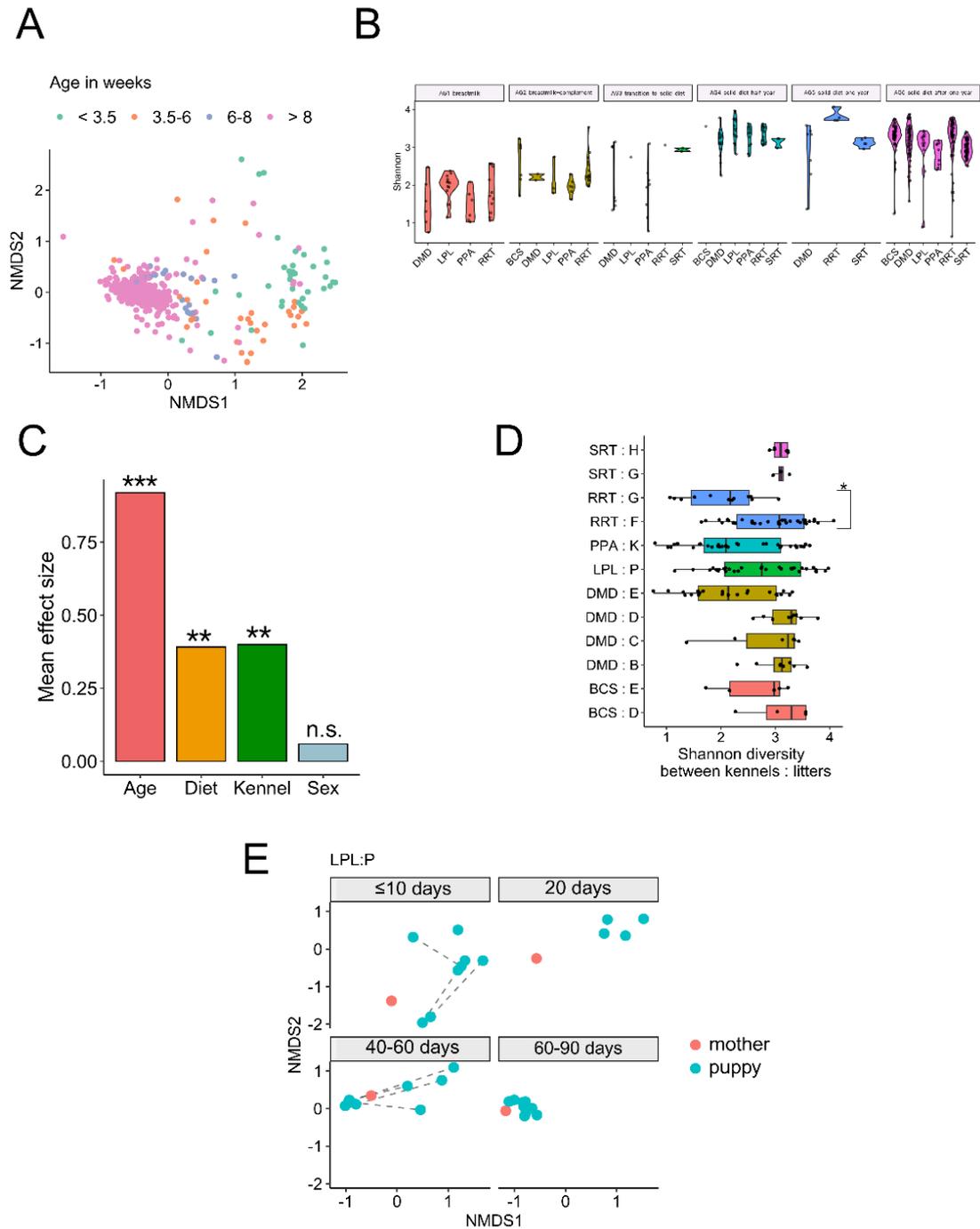


Figure 2: Longitudinal diversity patterns and within-litter variation in canine gut microbiome. (A) NMDS plot revealing a developmental gradient in the gut microbiota with increasing homogeneity in adulthood. (B) Shannon diversity index across age groups showing microbial expansion during early development. Age groups: 1 (<3.5 weeks), 2 (3.5–6 weeks), 3 (6–8 weeks), 4 (10–26 weeks), 5 (26–52 weeks), and 6 (>52 weeks). (C) Relative effect sizes of cohort variables on alpha diversity (Shannon index). Analysis was based on a cumulative link model adjusted for covariates and subject ID (** $P < 0.001$; ** $P < 0.01$; n.s.: non significant). (D) Within-kennel litter comparisons of Shannon diversity showing mostly modest differences with one significant exception (Wilcoxon test, * $P < 0.05$). (E) Beta-diversity distances within a single litter. Samples from the mother and pups are shown in red and blue, respectively. Dotted lines connect longitudinal samples from the same subject taken within the same age period.

increase was followed by a gradual tapering, with diversity values reaching an apparent plateau by around six months of age (Fig. 2B). This developmental trajectory was consistent across kennels and age strata, suggesting that the maturation pattern is robust to differences in housing environment and kennel-specific management practices.

4.5. Effects of Environment and Host Sex on Community Composition Are Modest

To assess the relative influence of host and environmental factors on alpha diversity, effect sizes were estimated using cumulative link models adjusted for covariates and subject ID. Age emerged as the dominant determinant of Shannon diversity ($P < 0.001$), while kennel exerted a smaller but statistically significant effect. No significant association was detected for host sex (Fig. 2C).

Comparisons among litters within the same kennel revealed generally minor differences in alpha diversity, with only a single litter pair showing a statistically significant difference (Wilcoxon test, $P < 0.05$; Fig. 2D). Analysis of beta diversity within a representative litter (LPL:P) demonstrated early divergence between puppies and their dam during the first 10–20 days of life, followed by increasing similarity by 40–60 days of age that remained stable at later time points (Fig. 2E). Collectively, these findings indicate that age-related maturation, together with associated dietary transitions, is the primary driver of microbiome development, whereas environmental variation at the kennel or litter level contributes more modestly.

4.6. Developmental Stage Shapes Taxonomic Composition

Examination of the most abundant genera across litters and kennels revealed clear temporal changes in taxonomic composition (Fig. 3A). During the weaning transition (3.5–8 weeks), early-life-associated genera such as *Escherichia*, *Megamonas*, *Lactobacillus*, and *Ruminococcus* were predominant. In contrast, the post-weaning period was characterized by increased relative abundances of *Blautia*, *Peptacetobacter*, and *Fusobacterium*.

At early weaning stages (6–8 weeks), *Lactobacillus* displayed kennel-specific presence and diet-associated abundance patterns ([Supplementary Figure 1](#)). Notably, *Blautia* was detected consistently across all life stages and exhibited a steady increase in abundance over time (Fig. 3A), suggesting its establishment as a core post-weaning genus.

Species-level analysis identified *Faecalimonas umbilicata*, *Ruminococcus gnavus*, *Blautia hansenii*, *Blautia producta*, and *Megamonas rupellensis* as among the most prevalent taxa

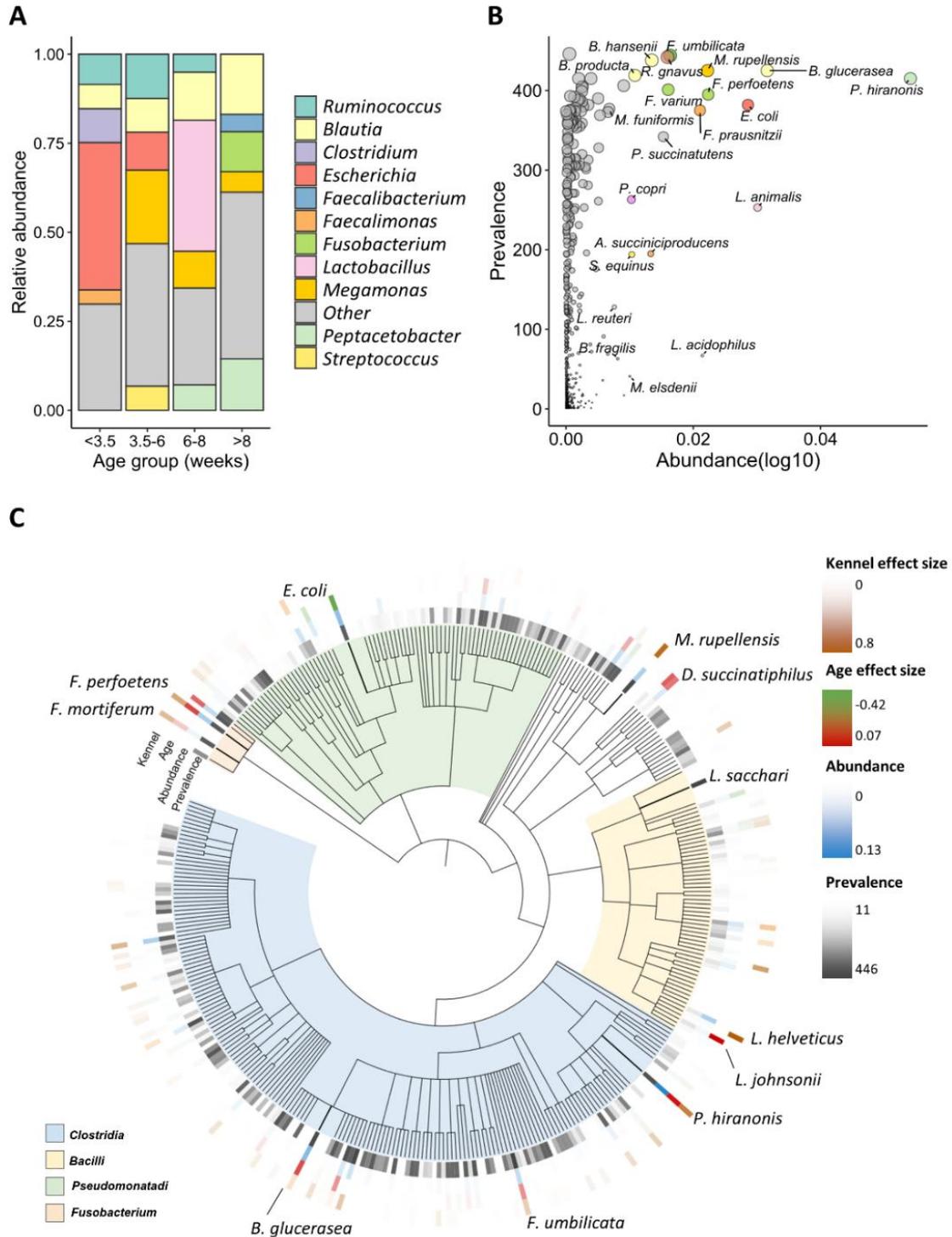


Figure 3: Key taxa of the canine gut microbiome: abundance-prevalence patterns and age/kennel associations. (A) Bar plot of top genus relative abundances across kennels and litters divided by animal's life phase. (B) Scatter plot of the most abundant (x-axis) and most prevalent (y-axis) species across all samples in the cohort. Dot size is proportional to prevalence; dot color corresponds to genus for the top 25 data points and is harmonized with panel A. (C) Phylogenetic tree of the top 350 taxa identified across all kennels by prevalence and abundance. Mean effect sizes obtained via mixed-effect models of association with age and kennel are shown with contrasting color scales. Species with the highest values per category are highlighted.

across the cohort, while *Peptacetobacter hiranonis* and *Blautia glucerasea* showed the highest relative abundances (Fig. 3B). A taxonomic tree of the 350 most abundant taxa revealed distinct associations with both age and kennel of origin (Fig. 3C). Hierarchical clustering at the genus level further demonstrated that age and diet exerted stronger influences on microbial community structure than host sex ([Supplementary Figure 2](#)). Mixed-effects modeling identified distinct sets of microbial taxa associated with each of four key factors: age, kennel, diet, and host sex ([Supplementary Figures 3–6](#)).

4.7. Species-Level Core Microbiome Across Age

Using a prevalence-based framework, a species-level core microbiome was defined within each age group, and three complementary analyses were conducted. First, application of a stringent 90% prevalence threshold identified a set of 13 species consistently detected across all age groups; however, their mean relative abundances varied systematically with age (Fig. 4A). This ubiquitously detected core was predominantly composed of short-chain fatty acid (SCFA)-

associated *Clostridia* (e.g., *Blautia* spp., *Faecalimonas umbilicata*)⁹⁸ and the bile acid-transforming species *Peptacetobacter hiranonis*, which has been associated with maintenance of intestinal barrier integrity, colonization resistance against pathogens such as *Clostridioides difficile*, and broader host metabolic homeostasis⁹⁹. Certain taxa, including *Megamonas ruppellensis*, were prominent during both early and later life stages, aligning with shifts in diet and increasing microbial community complexity.

Second, pairwise Jaccard similarity analysis of the 90% prevalence-defined core sets revealed the highest overlap between adjacent late-life stages (e.g., 3–7 years and 7–10 years), indicating stabilization of an adult-like core microbiome with gradual turnover (Fig. 4B). In contrast, similarity between pre-weaning and adult stages was minimal, supporting the weaning period as a major ecological breakpoint point in microbiome development.

Third, to evaluate broader patterns of shared core membership, a more inclusive 80% prevalence threshold was applied in an UpSet analysis (Fig. 4C). The largest intersection corresponded to the same 13 universally detected species identified under the stricter criterion. Additional intersections spanning two to five adjacent age groups were observed, indicating progressive restructuring of core composition rather than abrupt replacement during maturation.

Functional Context: The persistent core microbiome was enriched in short-chain fatty acid

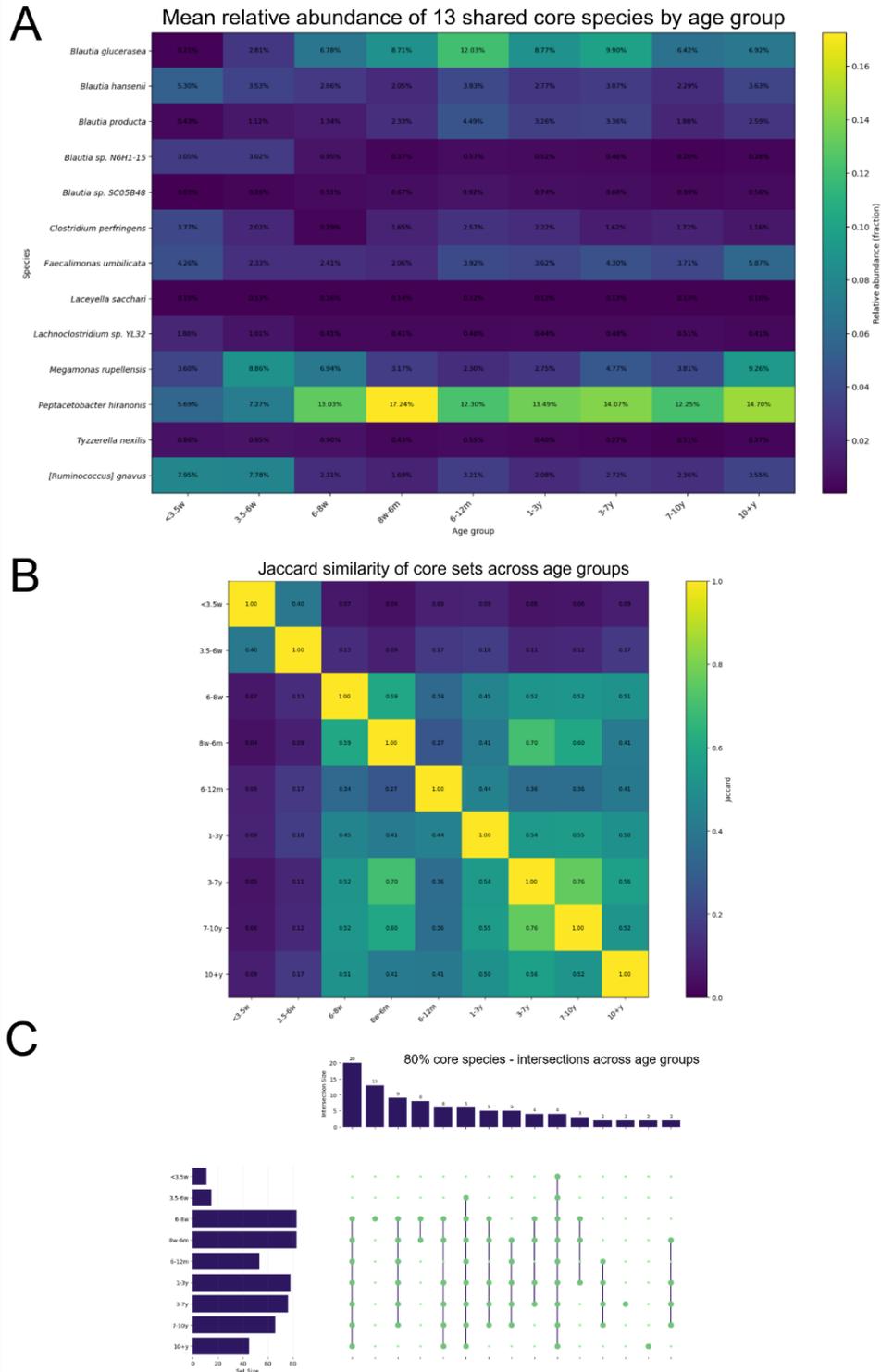


Figure 4: Species-level core microbiome across age groups. A) Mean relative abundance (per age group) of the 13 species present in all age groups at $\geq 90\%$ prevalence (prevalence-only). **B)** Pairwise Jaccard similarity of 90%-prevalence core sets between age groups. **C)** UpSet plot of 80%-prevalence core sets: left, set size per age group; top, intersection size; bottom, contributing age groups (green dots, purple connectors). Species labels are italicized at rank. Thresholds and color palette are harmonized across panels as indicated.

(SCFA)–producing taxa and bile acid–modulating species, which have been reported to contribute to mucosal integrity and immune–metabolic regulation across life stages. Variations observed during early and late life coincided with developmental changes in diet and host physiology, as well as shifts in overall community complexity.

4.8. Developmental Rewiring of the Microbial Network

SparCC-based co-occurrence network (CON) analysis revealed marked age-dependent differences in microbial interactions (Fig. 5). In puppies younger than 3.5 weeks, the inferred co-occurrence network was sparsely connected and comprised only a small subset of co-occurring taxa. During the weaning transition (6–8 weeks), network density and modularity increased, indicating progressive structuring of microbial communities. By 1–2 years of age, the adult microbiome exhibited a highly connected network with strong positive associations (red edges) among core taxa, such as *Clostridium*, *Bacteroides*, *Sutterella*, and *Fusobacterium*. These transitions are consistent with progressive compositional maturation of the gut microbiome and increasing ecological structuring during development.

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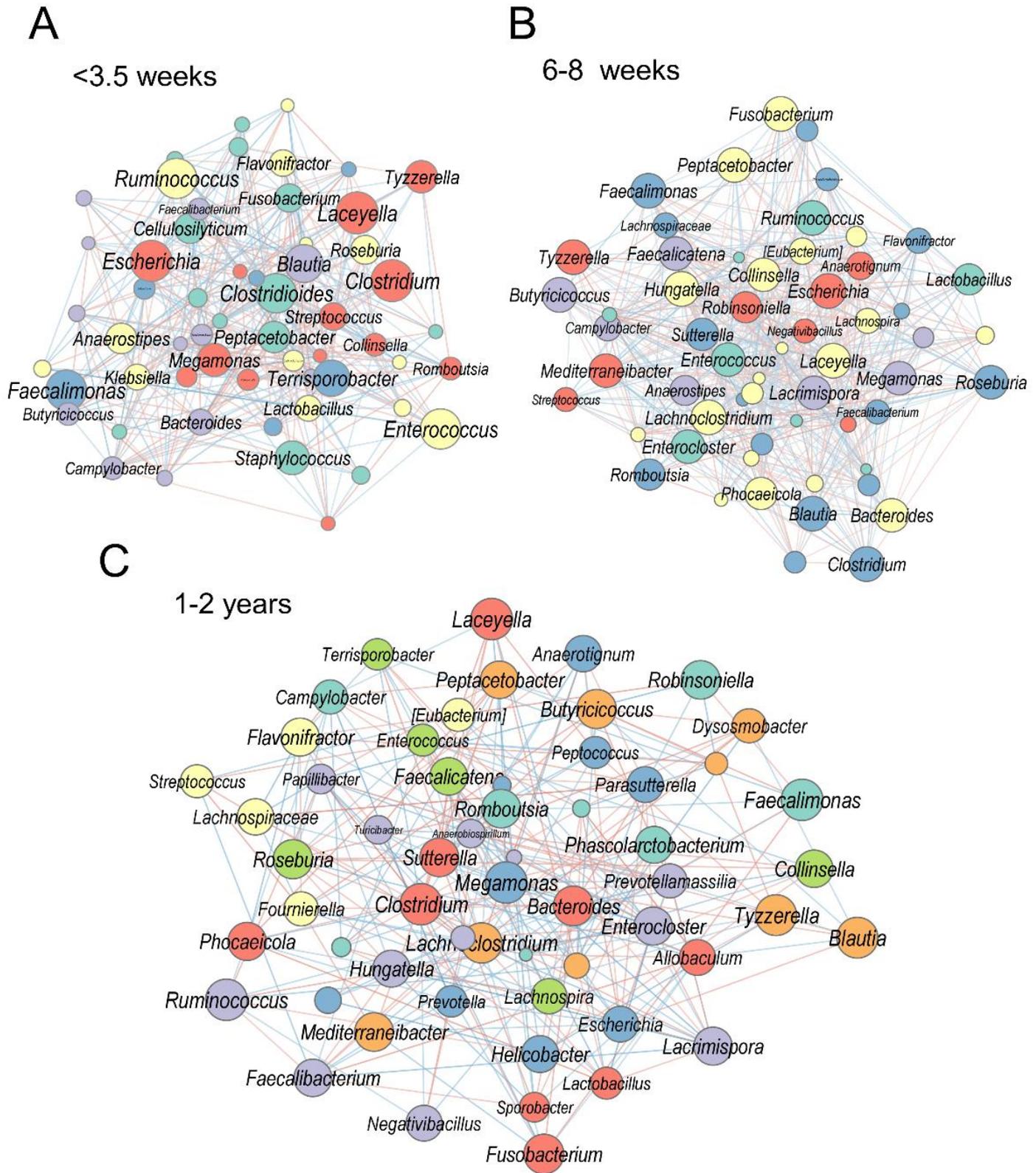


Figure 5: Co-occurrence relationships between age categories reflect dietary shifts. (A) Co-occurrence network (SparCC) at up to 3.5 weeks. (B) Network at 6–8 weeks. (C) Network at 1–2 years. Node size is proportional to genus prevalence. Nodes are colored by Louvain cluster; edges are colored by correlation (blue = negative, red = positive).

4.9. Birth Mode Influences Microbiome Composition During Early Postnatal Development

To assess the effect of delivery mode on early microbiome structure, two litters from the same dam and kennel (Le Petit Lapin)—one delivered by cesarean section and one by vaginal delivery—were compared under matched age (8–10 weeks) and dietary conditions. NMDS-based beta diversity analysis demonstrated separation between the groups, indicating differences in overall community composition (Fig. 6A), whereas Shannon alpha diversity did not differ significantly (Fig. 6D).

At the taxonomic level, cesarean-delivered puppies exhibited significantly higher relative abundances of *Lactobacillus* ($P_{\text{adj}} = 0.008$) and *Prevotella* ($P_{\text{adj}} = 0.038$), and a lower relative abundance of *Romboutsia* ($P_{\text{adj}} = 0.045$) compared to vaginally delivered litter (Fig. 6B–6C). These findings suggest that delivery mode may influence early gut colonization patterns under otherwise controlled environmental conditions. In contrast to reports from human cohort studies indicating that infants delivered by cesarean section exhibit reduced abundances of microbial taxa commonly associated with vaginal birth, including *Bacteroides* and *Lactobacillus*^{100,101}, cesarean-delivered puppies in the present cohort demonstrated higher relative abundances of *Lactobacillus* and *Prevotella* at 8–10 weeks of age.

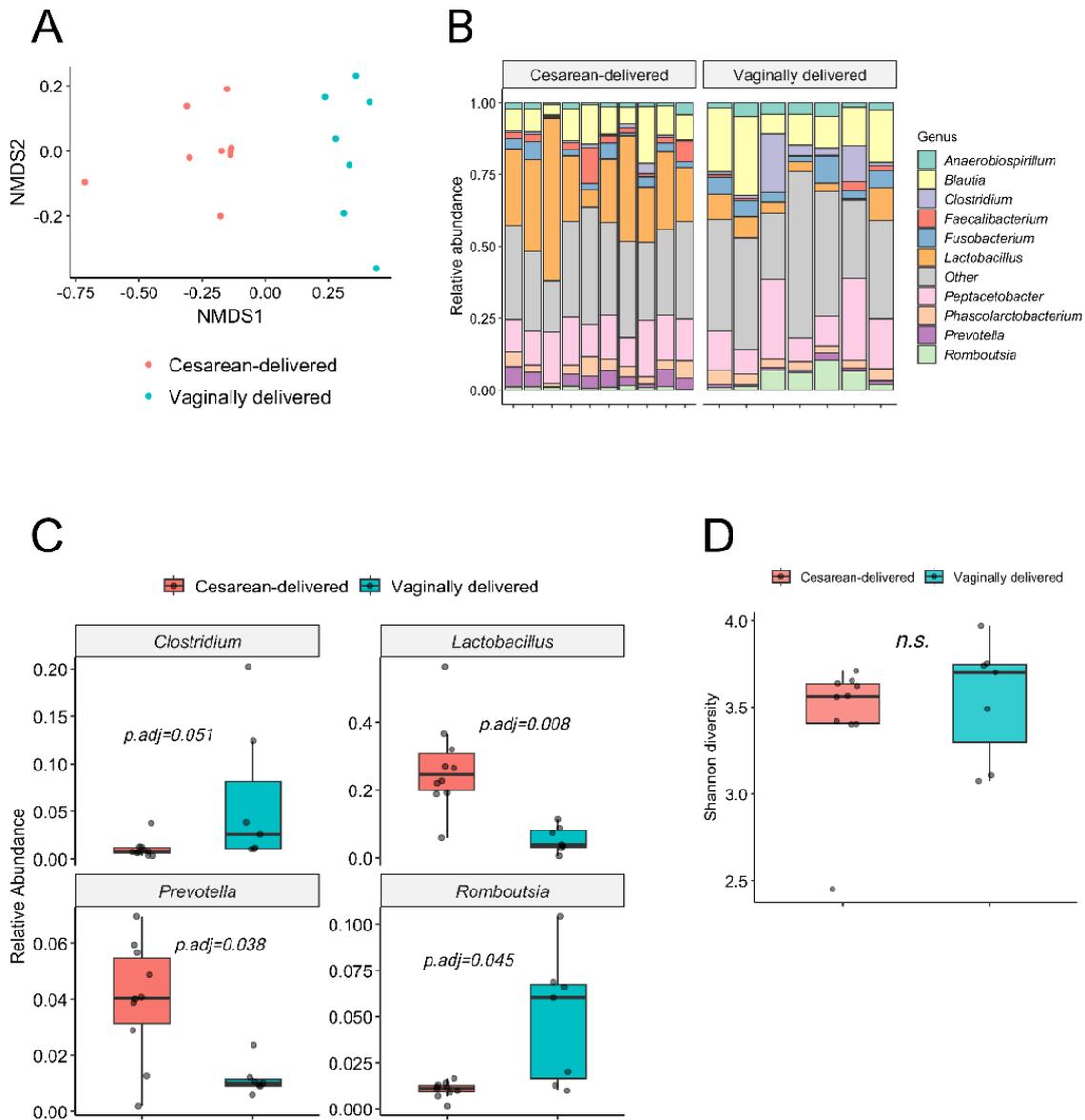


Figure 6: Comparison of cesarean section vs. vaginally delivered pup microbiomes. (A) Non-metric multidimensional scaling based on delivery mode. **(B)** Shannon diversity between delivery modes. **(C)** Stacked bar plots of the relative abundances of the top 10 genera of puppies grouped by delivery mode. **(D)** Box plots of differential relative abundance according to the mode of delivery showing the top four significantly different genera (Wilcoxon rank-sum test, B-H adjusted P -values).

4.10. Maternal Gut Microbiome Shifts with Reproductive Stage

The gut microbiota of dams exhibited stage-dependent variation across pregnancy and lactation. Shannon alpha diversity showed a transient reduction during late pregnancy and early lactation, followed by partial recovery after weaning (Fig. 7A). Despite close temporal proximity, prepartum and postpartum samples displayed distinct compositional profiles (Fig. 7B). The transition from prepartum to postpartum was characterized by marked turnover among the most

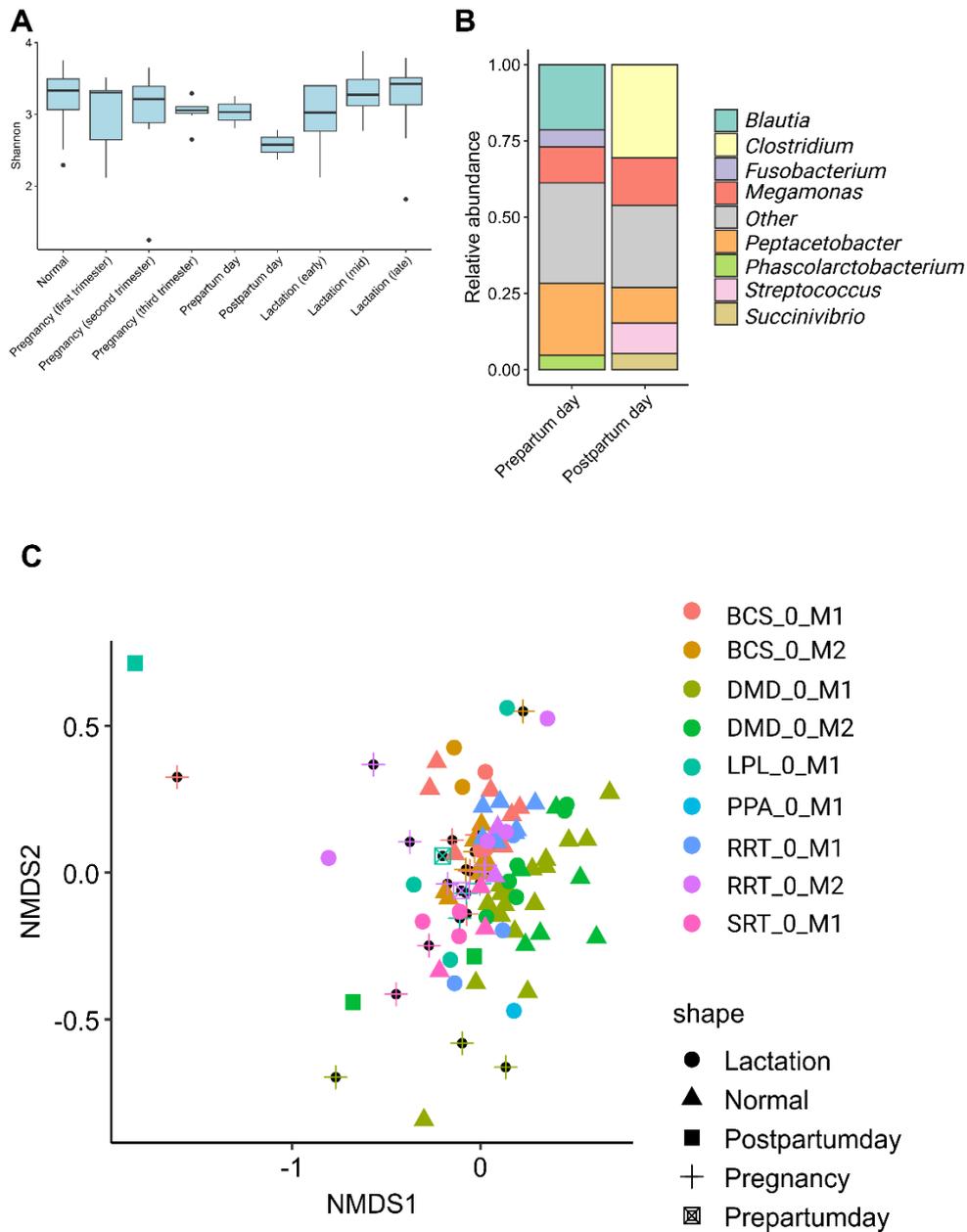


Figure 7: Gut microbiome dynamics in mother dogs across reproductive states. (A) Distribution of alpha diversities within mother dogs throughout normal state, pregnancy, and lactation. (B) Stacked bar plots of relative abundances in the pre- and postpartum days show a temporary shift in the microbiome. (C) Unsupervised NMDS clustering reveals that microbiome profiles cluster more strongly by mother identity than by reproductive state, with no consistent association with kennel or diet.

abundant genera, including the disappearance of *Blautia* and *Fusobacterium* and the emergence of *Clostridium* and *Streptococcus* (Fig. 7B). These findings demonstrate dynamic microbiome shifts associated with reproductive status. While the core microbiome composition of dams changed significantly across reproductive stages, these shifts were not associated with specific kennels or diet categories and were not consistently shared across individuals, as indicated by unsupervised clustering analysis (Fig. 7C).

5. DISCUSSION

The present longitudinal, species-resolved profiling of purebred Hungarian Pumi dogs indicates that gut microbiome maturation is predominantly an age-structured process, progressing from an early, variable phase toward a more homogeneous adult community. Alpha diversity increased markedly during early life, particularly around the weaning transition, and plateaued by approximately six months of age, while beta diversity analyses demonstrated gradual age-graded convergence toward an adult-like configuration. The consistency of these trajectories across kennels and litters suggests that age-associated developmental dynamics are largely robust to kennel-level environmental heterogeneity.

Taxonomic patterns further supported this developmental progression. Samples collected during early life (0–8 weeks) were characterized by higher relative abundances of *Escherichia*, *Megamonas*, *Lactobacillus*, and *Ruminococcus*, whereas later developmental stages were increasingly dominated by *Blautia*, *Peptacetobacter*, and *Fusobacterium*. Notably, *Blautia* displayed a gradual and sustained increase across successive life stages. The relatively brief weaning interval (6–8 weeks) represented a distinct transitional phase, during which kennel-specific and diet-associated variation in *Lactobacillus* was observed, consistent with a shift from milk-adapted to solid-food-adapted microbial communities. Collectively, these observations identify weaning as a pivotal ecological transition in canine gut microbiome assembly.

Comparable patterns have been reported in humans and other mammals, where early-life dominance of *Enterobacteriaceae* and *Lactobacillaceae* is progressively replaced by fiber-associated *Clostridia* such as *Blautia*, *Ruminococcus*, and *Faecalibacterium* following the introduction of solid food¹⁰². In carnivorous mammals, including dogs, *Fusobacterium* often becomes a prominent post-weaning taxon, reflecting adaptation to meat-rich diets⁹. The continuous increase of *Blautia* observed in this cohort parallels its rise in post-weaning communities across species and is consistent with its proposed role as a core genus during gut maturation¹⁰³. In contrast to humans, where *Bifidobacterium* may remain abundant during weaning¹⁰⁴, dogs in this cohort exhibited low and inconsistent *Bifidobacterium* levels throughout development. Similar low abundance of this genus has been reported in prior canine studies⁹. Collectively, these similarities and divergences highlight the translational value of canine models while emphasizing species-specific characteristics of microbiome development.

Consistent with the statistical modeling results, age emerged as the dominant determinant of alpha diversity, whereas kennel effects were comparatively modest and host sex showed no significant association. Differences among litters within the same kennel were generally modest. These findings suggest that, under typical husbandry and dietary conditions, intrinsic developmental programming and age-coupled diet transitions exert stronger influence than contextual environmental variation in shaping microbiome assembly. From a methodological perspective, these findings emphasize the importance of longitudinal age matching and careful consideration of weaning status in the design and interpretation of canine microbiome studies.

Network analyses further indicated that microbe–microbe association structure undergoes progressive maturation with age. SparCC-derived co-occurrence networks were sparsely connected in neonates, became denser and more modular during the weaning transition (6–8 weeks), and exhibited highly connected structures in adults, including strong positive associations among dominant taxa such as *Bacteroides*, *Clostridium*, and *Fusobacterium*. Although correlation-based networks do not imply direct ecological interactions, the observed increase in connectivity and modularity is consistent with enhanced niche differentiation and cross-feeding potential as diets diversify and host physiology stabilizes.

Delivery mode was associated with detectable genus-level differences within the 8–10 week age window. Cesarean-delivered puppies exhibited higher relative abundances of *Lactobacillus* ($P_{\text{adj}} = 0.008$) and *Prevotella* ($P_{\text{adj}} = 0.038$), and a lower abundance of *Romboutsia* ($P_{\text{adj}} = 0.045$), compared with vaginally delivered littermates (Fig. 6B–6C), despite no significant difference in Shannon diversity between groups (Fig. 6D). This observation differs from findings in human neonates regarding *Prevotella* and from numerous studies documenting reduced *Lactobacillus* in cesarean-delivered infants^{100,101}, although it aligns with more recent observations by Pahirah et al., who reported higher *Lactobacillus* abundance in cesarean-born human neonates¹⁰⁵. These findings suggest that delivery mode–associated genus-level differences are unlikely to be uniform across species or developmental stages and may be influenced by species-specific postnatal ecology, including intensive dam–pup contact and coprophagic behavior, as well as kennel environment, weaning practices, and the later sampling window examined in this study (8–10 weeks). Given that the cesarean cohort comprised a single litter, the results should be interpreted with caution and validated in larger, multicenter cohorts with detailed documentation of perinatal management. In neonatal dogs, Zakošek Pipan et al. demonstrated that vaginally delivered puppies exhibited meconium microbiota predominantly derived from maternal vaginal communities, whereas cesarean-delivered puppies showed lower

diversity and a mixed resemblance to maternal vaginal and oral bacteria³⁶. Similarly, Rota et al. reported that amniotic fluid and meconium from cesarean-delivered puppies were dominated by *Acinetobacter*, *Staphylococcus spp.*, and *Bacillus spp.*³⁹. In conjunction with the present findings, these data suggest that although delivery mode-associated microbiota differences are conserved in principle, their direction and taxon-level patterns are context- and time-dependent.

Stage-linked variation was also observed in dams. Transient reductions in alpha diversity during late pregnancy and early lactation, accompanied by compositional turnover across the pre- to postpartum transition, indicate that reproductive physiology contributes to temporal modulation of the maternal gut microbiome. Although these shifts were not consistently associated with kennel or diet and were not uniformly shared across individuals, they demonstrate that maternal microbial communities are dynamically responsive to physiological state. Such plasticity may represent an additional axis influencing early-life microbial exposure, potentially interacting with delivery mode and postnatal environmental contact to shape neonatal gut colonization.

Methodologically, the application of full-length 16S rRNA gene sequencing enabled species-level resolution within a dense longitudinal framework, facilitating fine-scale taxonomic and association analyses while minimizing batch effects. This high-resolution approach allowed detailed characterization of core microbiome structure and detection of subtle developmental transitions that may remain obscured in short-read amplicon studies. Nevertheless, several limitations should be acknowledged. The cohort was restricted to a single breed, limiting generalizability beyond Hungarian Pumi dogs and warranting replication across diverse breeds and mixed-breed populations. As an observational study, causal relationships cannot be established, and co-occurrence networks derived from compositional data reflect statistical correlations rather than direct ecological interactions. Furthermore, amplicon sequencing constrains functional inference; integration with shotgun metagenomics, metatranscriptomics, and metabolomics would provide deeper insight into metabolic capacity and activity across developmental stages. The cesarean comparison was underpowered, as it involved a single litter, and potential residual confounding related to subtle husbandry differences cannot be excluded. Finally, fecal microbiome profiling primarily represents distal intestinal communities and may not fully capture microbial composition throughout the entire gastrointestinal tract.

In summary, the findings of this thesis identify age—and the dietary transitions that accompany it—as the principal determinants of canine gut microbiome assembly under controlled breeding conditions, whereas kennel context, litter effects, and host sex exert comparatively modest

influence. Because age and diet are intrinsically intertwined during early development, their independent contributions cannot be entirely disentangled; however, adult dietary practices were largely stable, with BARF feeding confined to a single kennel, thereby limiting diet-related confounding at later stages. The weaning period emerges as a critical developmental window characterized by rapid ecological restructuring, progressive remodeling of microbial association networks, and stabilization of core taxa. In addition, reproductive stage-associated variation in the maternal gut microbiome suggests that physiological state represents an additional temporal determinant of microbial dynamics, with potential implications for early-life microbial exposure. Preliminary evidence that delivery mode influences genus-level composition further highlights the sensitivity of early colonization processes to perinatal factors. By integrating dense longitudinal sampling with species-level resolution, this work establishes a high-resolution developmental framework for the canine gut microbiome and reinforces the suitability of dogs as a comparative model for microbiome research. Future investigations should expand cesarean cohorts, incorporate functional multi-omics approaches, and prospectively profile dam-pup-environment triads to clarify mechanistic pathways and inform targeted microbiome modulation strategies in veterinary and comparative medicine.

6. SUMMARY

The gut microbiome undergoes dynamic age-related restructuring influenced by dietary transitions and maternal factors. This thesis presents a species-level, long-read 16S rRNA gene survey of longitudinal gut microbial community dynamics in a translational canine model. A total of 84 purebred Hungarian Pumi dogs comprising the main cohort were profiled across early-life and reproductive stages, generating 446 fecal samples collected longitudinally from 55 vaginally delivered puppies followed from birth to 81 weeks of age, their mothers sampled during pregnancy and lactation, and adult control dogs from six kennels. Detailed dietary metadata and reproductive status were recorded throughout the study. Additionally, a cesarean-section subgroup comprising five puppies (8–10 week age window), yielding a total of 10 samples (two samples per puppy), was included in the study and analyzed independently from the main cohort.

Age emerged as the strongest determinant of alpha diversity, with a rapid increase during the weaning transition and stabilization by approximately six months of age. Beta diversity analyses revealed structured compositional transitions from early developmental phases toward increasingly uniform, adult-like communities. Within-kennel variation remained modest,

consistent with shared environmental exposures. Mixed-effects modeling demonstrated robust associations between specific taxa and age, diet, and kennel environment. SparCC-inferred co-occurrence networks indicated progressive increases in ecological complexity and modular organization with maturation.

Delivery mode influenced early-life microbiome composition, with *Lactobacillus spp.* significantly more abundant in cesarean-born puppies than in vaginally delivered littermates during the 8–10-week window. Maternal gut microbiota exhibited reproducible stage-associated shifts during pregnancy and lactation, characterized by transient alpha diversity variation and compositional dynamics across the peripartum transition; however, these changes were not consistently linked to kennel or diet and were not uniformly shared across individuals.

In conclusion, domestic dogs follow a reproducible, age-structured trajectory of gut microbial maturation under controlled breeding conditions. This developmental pattern parallels specific aspects of human microbiome development, including delivery mode-associated compositional differences and diet-responsive taxa. Through longitudinal sampling, species-level microbial profiling, and covariate-adjusted mixed-effects modeling, this thesis establishes a developmental reference framework for the canine gut microbiome and reinforces the translational relevance of the dog as a comparative model in microbiome research.

7. FUNDING

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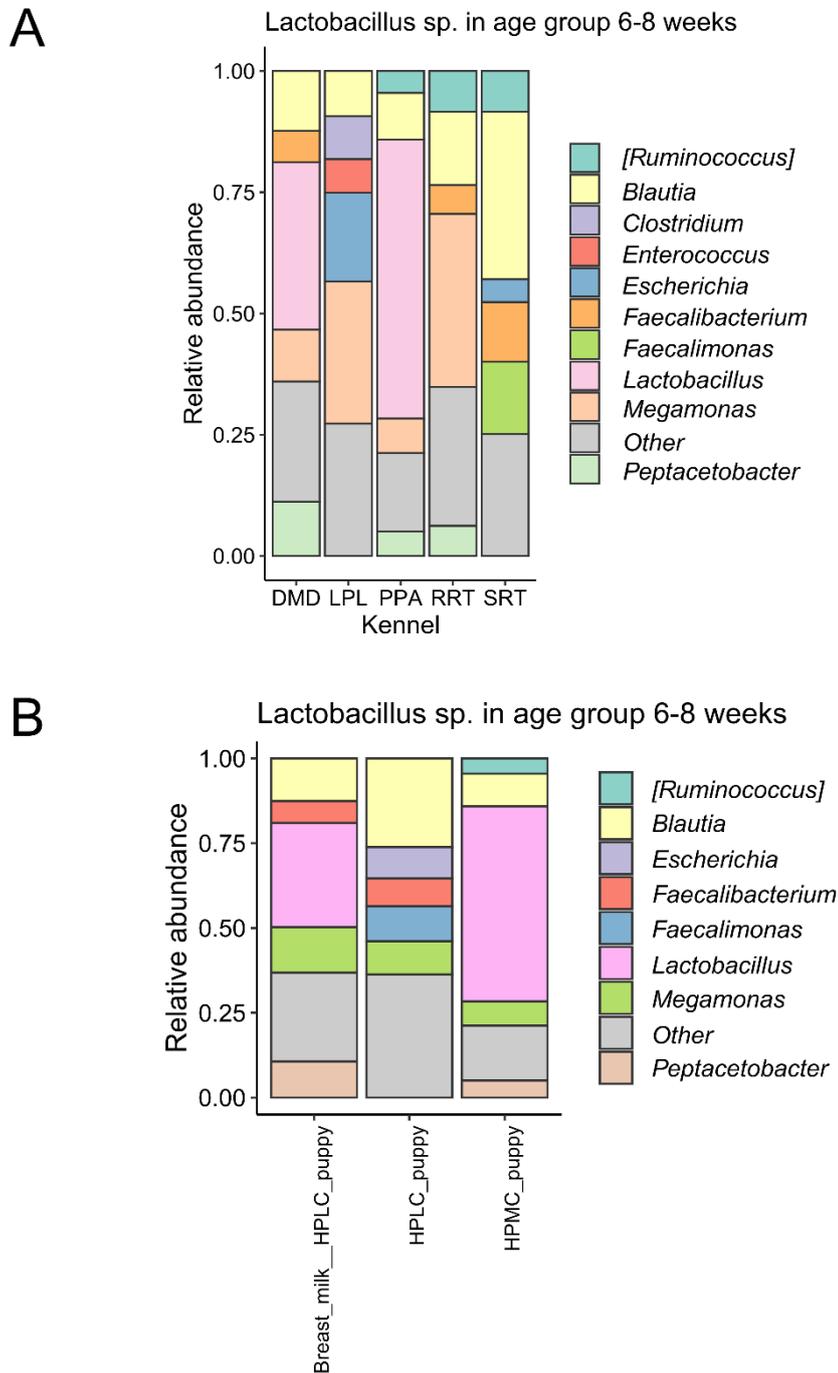
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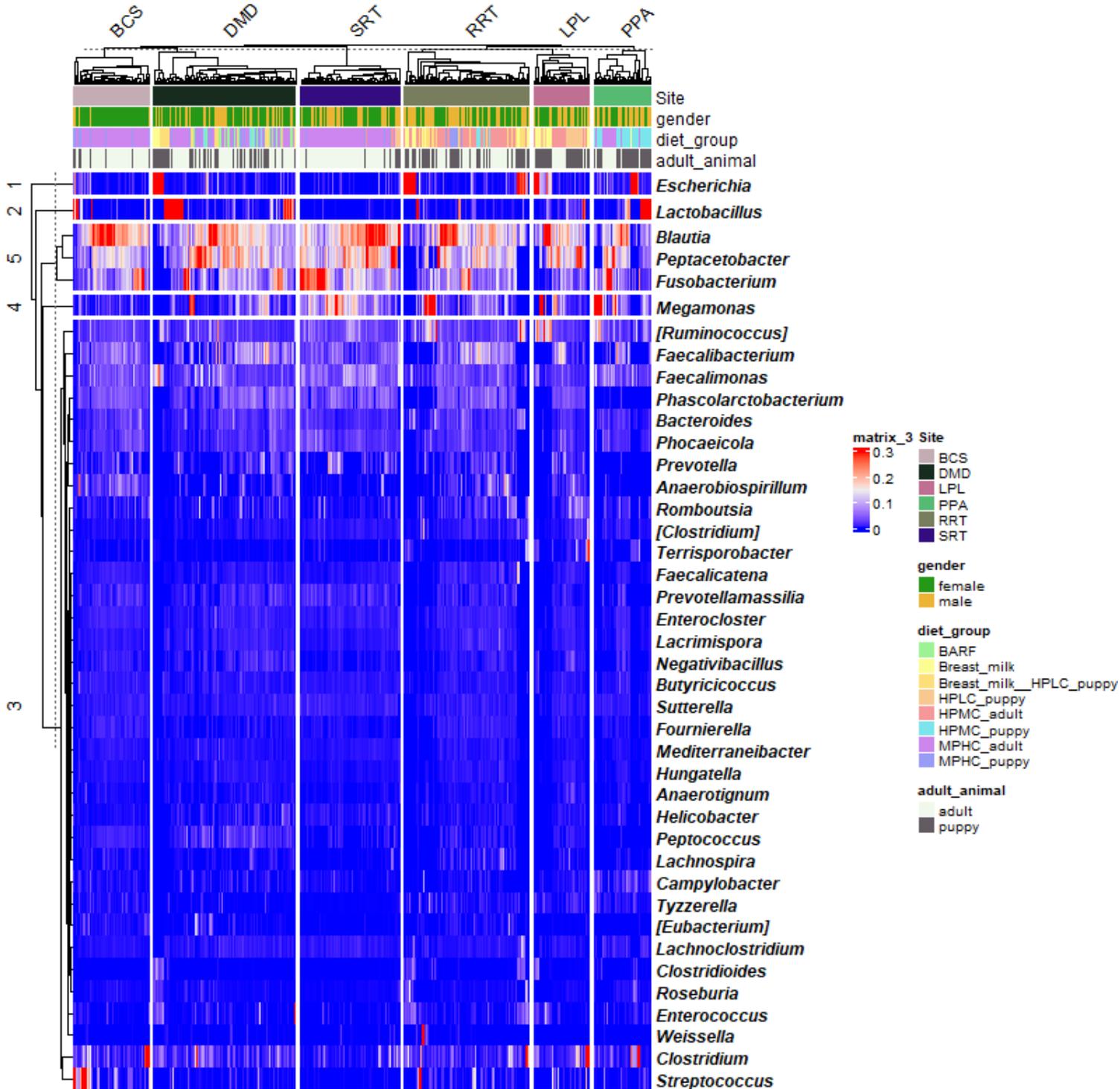
10. SUPPLEMENTARY FIGURES

10.1. Supplementary Figure 1



Supplementary Figure 1: Early-Weaning *Lactobacillus* Patterns (6–8 Weeks): Kennel and Diet. A) Relative abundance of the top 10% most abundant genera, focusing on *Lactobacillus* sp. Presence in the 6-8 weeks age group per kennel. **B)** *Lactobacillus* sp. Abundance per diet in the 6-8 weeks age group.

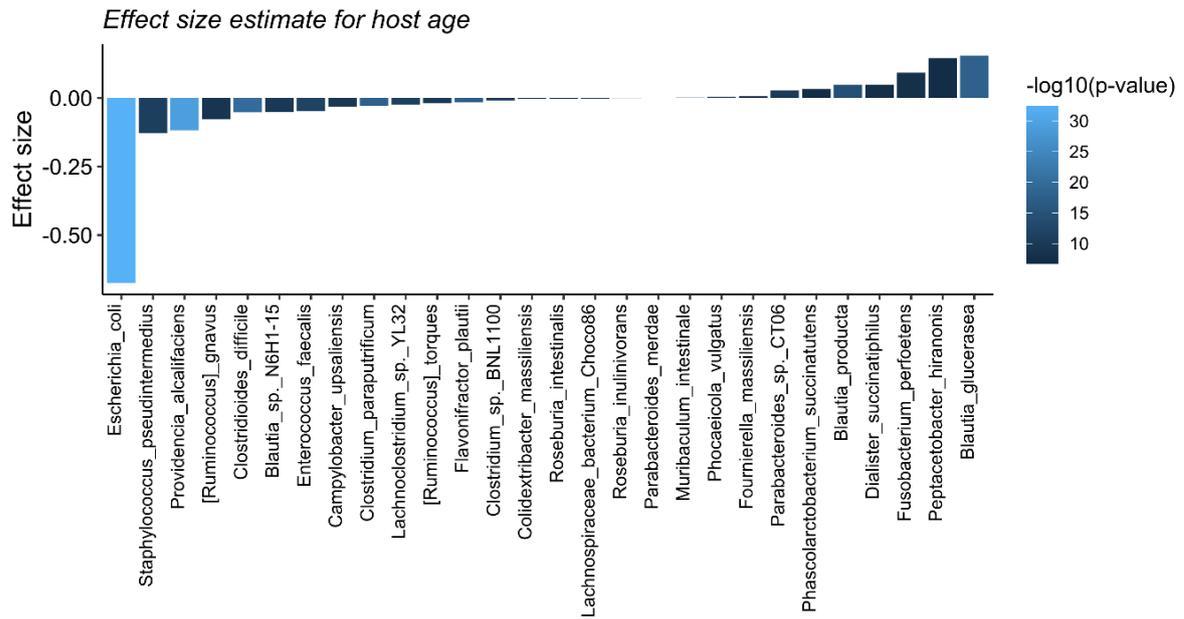
10.2. Supplementary Figure 2



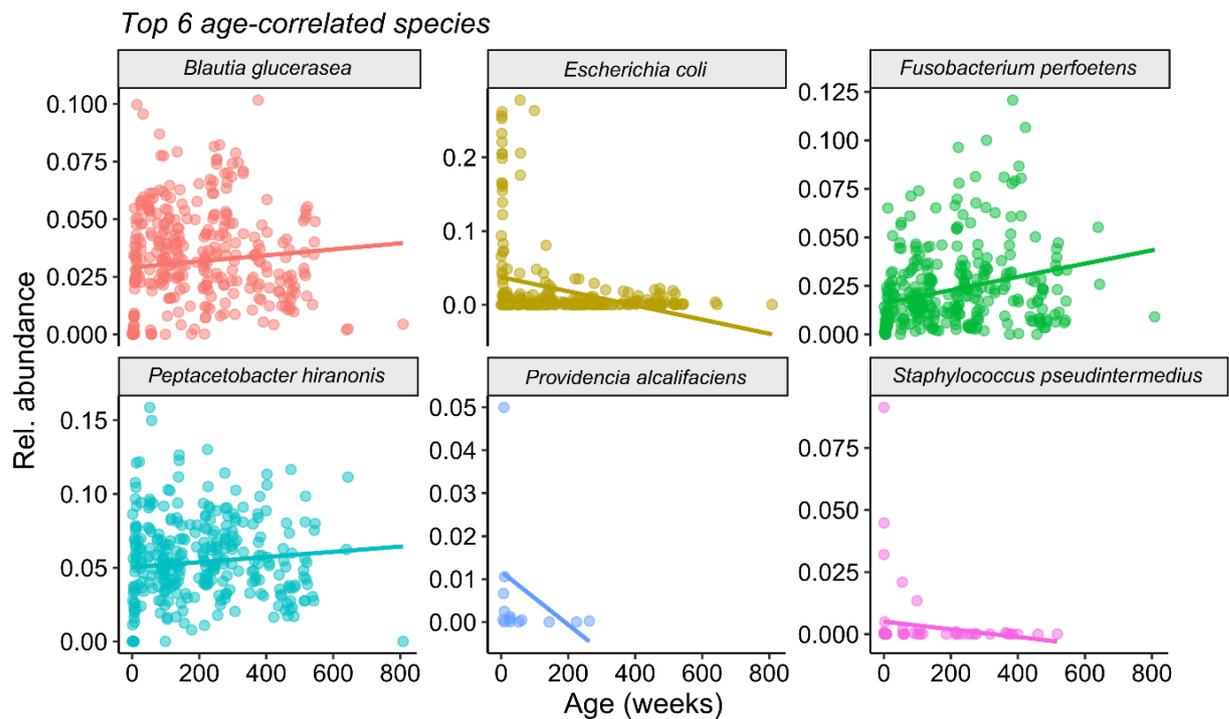
Supplementary Figure 2: Heatmap of relative abundances of the top 40 genera across all kennels. Hierarchical clustering shows that age and diet provide more structured clustering than sex. While *Blautia* is represented by several different species in the dataset, complicating the analysis, genus-level clustering results in characteristic patterns for this taxon. Abbreviations are as follows: HPLC: High-Protein-Low-Carbohydrate, HPMC: High-Protein-Moderate-Carbohydrate, MPHC: Moderate-Protein-High-Carbohydrate.

10.3. Supplementary Figure 3

A



B

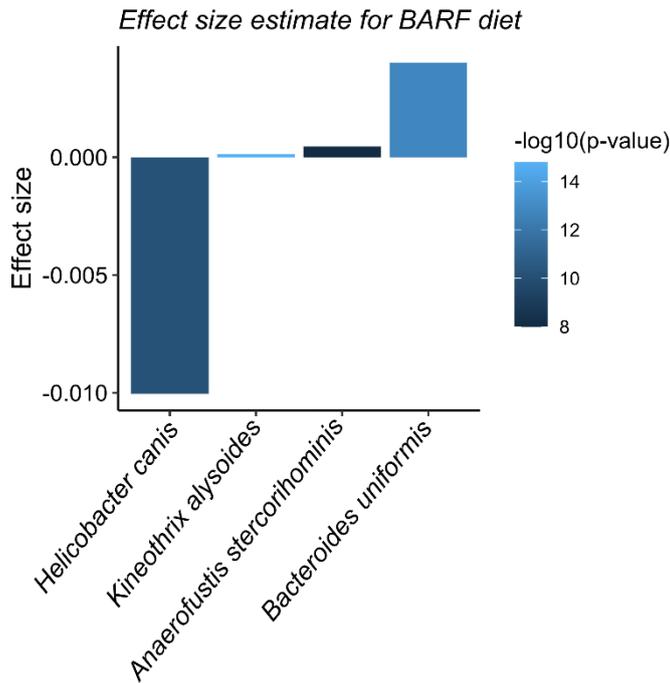


Supplementary Figure 3: Age-Associated Species: Effect Sizes and Abundance Trajectories.

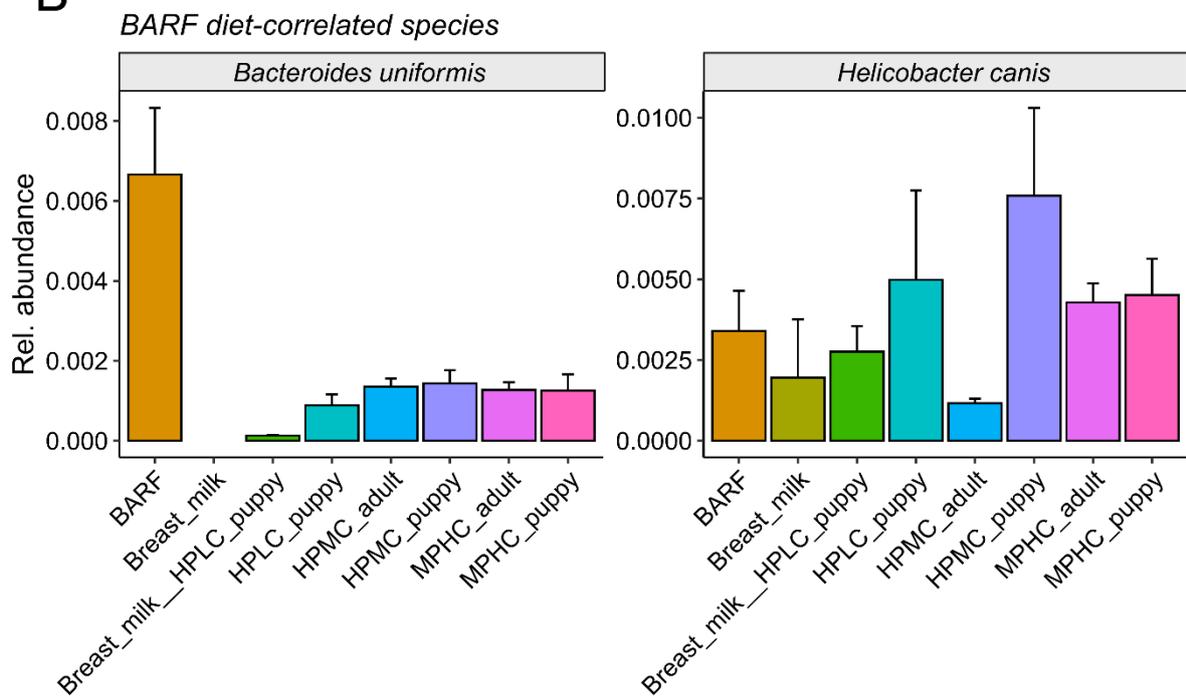
A) Bar chart of mixed-effects model estimates for age-correlated species. Y-axis displays the effect size estimate; color gradient is proportional to p-value of the interaction. **B)** Scatter plots of species relative abundance vs. host age in weeks; best-fit lines indicated per species.

10.5. Supplementary Figure 5

A



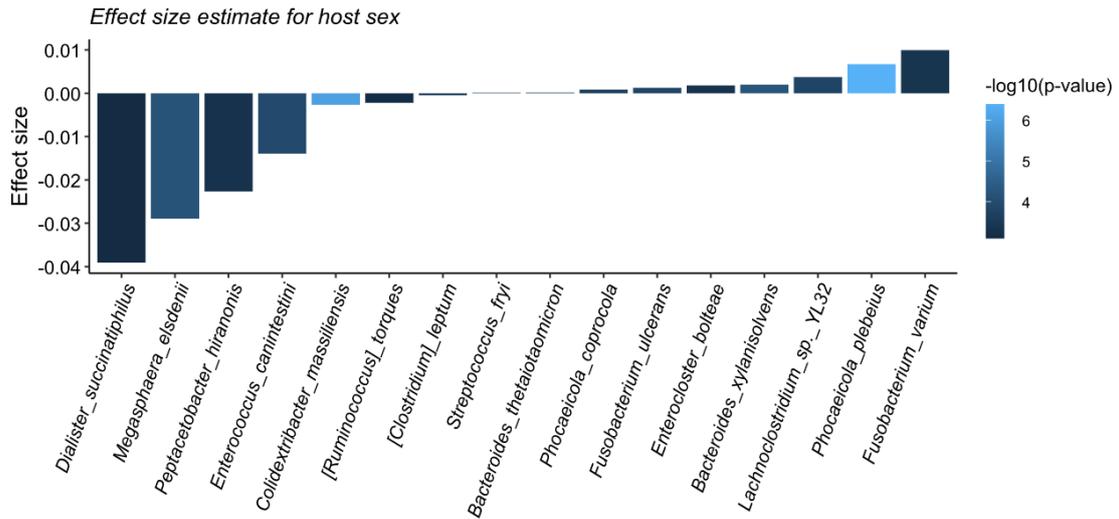
B



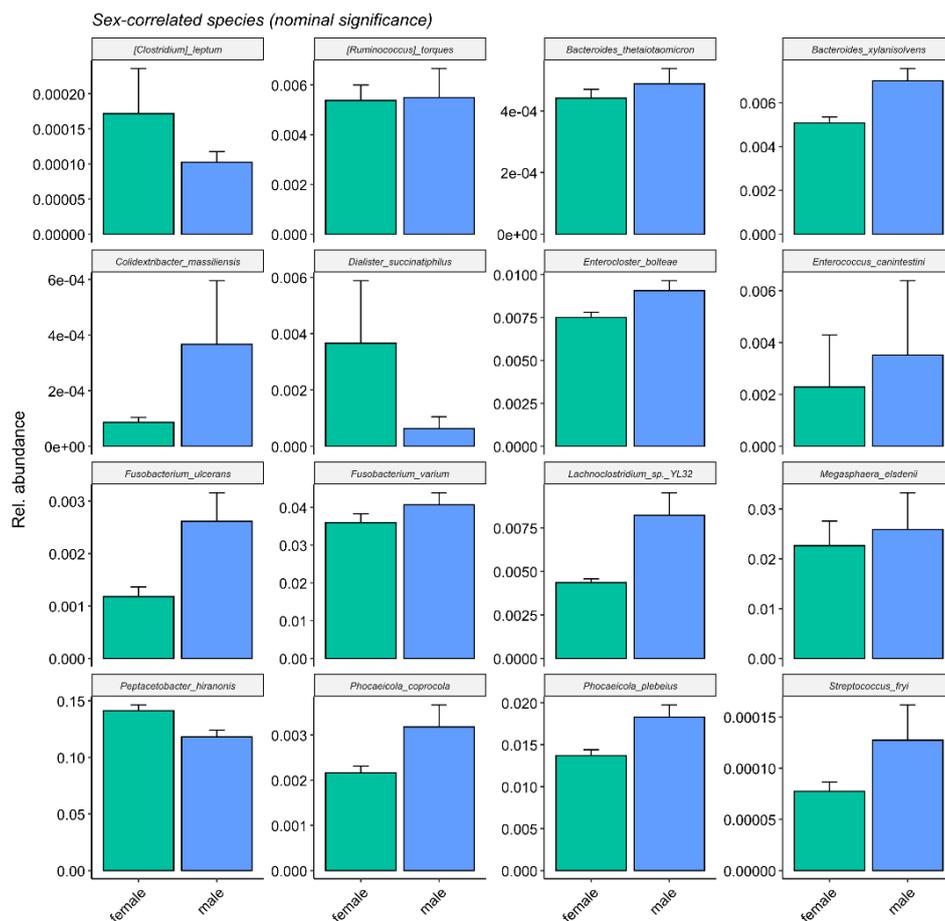
Supplementary Figure 5: Effects of BARF-diet on Microbial Composition. **A)** Effect size estimates from mixed-effects models for diet-associated species. Y-axis displays the effect size estimate, color gradient is proportional to p-value of the interaction. **B)** Bar charts of species relative abundance vs. Diet category; error bars indicate standard deviation. Abbreviations for host diet terms: HPLC (high-protein–low-carbohydrate), HPMC (high protein–moderate-carbohydrate), MPHC (moderate-protein–high-carbohydrate).

10.6. Supplementary Figure 6

A



B



Supplementary Figure 6: Sex-Associated Microbial Composition. **A)** Bar chart of mixed-effects model estimates for sex-associated species. Y-axis displays the effect size estimate, color gradient is proportional to p-value of the interaction. **B)** Bar charts of species relative abundance vs. sex; error bars indicate standard deviation.

11. SUPPLEMENTARY METHODS

11.1. DNA Extraction – Detailed Protocol

Fecal samples stored at -80 °C were thawed at room temperature for 40 min. Each sample was homogenized prior to aliquoting to ensure even microbial composition and to minimize microgeographical variation. Genomic DNA was extracted using the ZymoBIOMICS™ 96 MagBead DNA Kit-Dx (Zymo Research, Cat. No. D4308-E) according to the manufacturer's instructions, under sterile conditions in a Class II biosafety cabinet (SafeMate EZ 1.2, BIOAIR). For each sample, 750 µl of stool was transferred into a ZR BashingBead™ Lysis Tube (0.1 & 0.5 mm) and subjected to bead beating on a Vortex-Genie® 2 platform (Scientific Industries) for 40 min at speed 10. The lysate was centrifuged at 10,000 × g for 1 min, and 200 µl of the supernatant was transferred into a 1.5 ml DNA LoBind microtube (Eppendorf™ Safe-Lock). Next, 600 µl of ZymoBIOMICS™ MagBinding Buffer and 25 µl of ZymoBIOMICS™ MagBinding Beads were added. The mixture was pipette-mixed five times and incubated on a shaker plate (Vortex-Genie® 2, Scientific Industries) at speed ≤ 2 for 10 min. Tubes were placed on a magnetic stand (MagJET Separation Rack, Thermo Fisher Scientific) until beads pelleted. The supernatant was removed, and the pellet was washed with 500 µl of MagBinding Buffer, then with 500 µl of ZymoBIOMICS™ MagWash 1, and twice with 900 µl of ZymoBIOMICS™ MagWash 2, with each wash involving 1 min of mixing followed by brief centrifugation. Beads were air-dried by incubation at 55 °C for 10 min on a dry block heating element (Bio TDB 100, bioSan). DNA was eluted in 50 µl of ZymoBIOMICS™ DNase/RNase-Free Water by pipette mixing (5×) and incubating for 10 min on a shaker plate, followed by bead separation on a magnetic stand for 2–3 min. The eluate was transferred into a new DNA LoBind tube. DNA concentration was measured with a Qubit® 4 Fluorometer using the Qubit dsDNA HS Assay Kit (Invitrogen, USA), and DNA integrity was assessed on an Agilent 4150 TapeStation with Genomic DNA ScreenTape. gDNA was stored at -20 °C until library preparation.

11.2. 16S Library Preparation – Detailed Protocol

High-quality genomic DNA (DIN ≥ 6) was diluted to 7.5 µl with nuclease-free water (ThermoFisher Scientific, USA) and combined with 12.5 µl of LongAmp® Hot Start Taq 2× Master Mix (New England Biolabs, USA) and 5 µl of 16S barcode from the Oxford Nanopore Technologies (ONT) Rapid Sequencing Amplicons–16S Barcoding Kit (SQK-16S024). The mixture was gently pipette-mixed on ice.

PCR amplification was performed on a ProFlex PCR System (Applied Biosystems, Life Technologies) with the following cycling conditions:

- Initial denaturation at 95 °C for 1 min
- 25 cycles of: 95 °C for 20 s, 55 °C for 30 s, 65 °C for 2 min
- Final extension at 65 °C for 5 min, hold at 4 °C.

At room temperature, 15 µl of AMPure XP beads (Beckman Coulter, USA) was added to the PCR product and incubated for 5 min on a shaking mixer platform (Multi Bio RS-24, bioSan). Tubes were placed on a magnetic rack, the supernatant was discarded, and beads were washed twice with 100 µl of freshly prepared 70% ethanol. Beads were air-dried for 30 s and resuspended in 11 µl of Tris-HCl buffer (10 mM Tris-HCl, 50 mM NaCl, pH 8.0; bioWORLD, USA), incubated for 2 min, and placed back on the magnetic rack to recover the eluate.

Library concentration was determined using a Qubit® 4 Fluorometer with the Qubit dsDNA HS Assay Kit. Fragment size and quality were assessed on an Agilent 4150 TapeStation with D5000 ScreenTape, confirming the expected amplicon size (~1500 bp, full-length 16S V1–V9).

11.3. Sequencing Details

Twenty-four metabarcoded libraries were pooled equimolarly to a final amount of 100 fmol and sequenced on an ONT MinION platform using R9 flow cells. Sequencing data were basecalled with Dorado v0.8.0 in super accurate mode (minimum Q-score = 10).

12. SUPPLEMENTARY DATA

12.1. Supplementary Data 1

Supplementary Data 1: Host Diet Details. This table presents the feed compositions applied per kennel and life stage. Diets were categorized according to the FEDIAF guidelines for minimum protein requirements in complete dog foods by age group: [Puppy (age < 14 weeks: protein 25%; age ≥ 14 weeks: protein 20%) and Adult (protein 18%)]⁹³. Diet categories were defined as: High-Protein-Low-Carbohydrate_puppy (HPLC_puppy): Protein >30%, Carbohydrate < 30%; High-Protein-Moderate-Carbohydrate_puppy (HPMC_puppy): Protein >30%, Carbohydrate 30% – 40%; Moderate-Protein-High-Carbohydrate_puppy (MPHC_puppy): Protein 25% – 30%, Carbohydrate >40%; Moderate-Protein-High-Carbohydrate_adult (MPHC_adult): Protein 18% – 25%, Carbohydrate >40%; High-Protein-Moderate-Carbohydrate_adult (HPMC_adult): Protein 26% – 30%, Carbohydrate 31% – 40%.

Feed Commercial Name	Study Feed Category	Feed Analytical Composition	Carbohydrate	Energy content	Feed Ingredients	Feed Additives
Royal Canin Starter and Real Nature Junior Rind; Pferd	HPLC-puppy	Protein 38.0%, fat content 18.0%, crude ash 7.6%, crude fiber 3.0%, calcium 1.6%, phosphorus 1.2%	23.4%	3679 kcal/kg	Horse protein (28%), potatoes (18%), beef protein (15%), fresh beef (15%), beef fat (12%), potato flour (4%), apples (3%), peas (2%), carrots (1%), spinach (1%), glucosamine (0.026%), chondroitin sulfate (0.016%), mannan-oligosaccharides (0.015%), fructo-oligosaccharides (0.01%), Yucca schidigera (0.01%), cranberries (0.005%), rosemary (0.004%), psyllium husks (0.002%), algae (Ascophyllum nodosum, 0.0018%), Thyme (0.0014%), peppermint (0.0014%), dandelion (0.0012%), green-lipped mussels (0.0012%), parsley (0.001%). May contain traces of other ingredients.	Vitamin A 20000 IU, Vitamin D3 1500 IU, DL-methionine (technically pure) 125 mg, L-lysine monohydrochloride 25 mg, copper (amino acid copper chelate, hydrate) 15 mg, iron (iron (II) sulfate, monohydrate) 72 mg, iodine (potassium iodide) 0.65 mg, manganese (manganese (II) oxide) 35 mg, selenium (selenium in organic form from Saccharomyces cerevisiae CNCM I-3060 (inactivated selenium yeast)) 0.25 mg, zinc (amino acid zinc chelate, hydrate) 80 mg
Real Nature Pure Lamb; Rabbit ears	HPMC-adult	Protein 26.0%, fat content 16.0%, crude ash 8.6%, crude fibre 3.2%, calcium 1.7%, phosphorus 1.3%	36.2%	3537 kcal/kg	Lamb protein (32%), fresh lamb meat (25%), potato flakes (14%), potato flour (10%), lamb fat (8%), peas (4%), apples (3%), brewer's yeast (1%), carrots (1%), spinach (1%), linseed oil (0.5%), glucosamine (0.03%), chondroitin sulphate (0.02%), mannan oligosaccharides (0.02%), fructo oligosaccharides (0.01%), yucca schidigera (0.01%), cranberries (0.005%), rosemary (0.004%), psyllium husks	Not specified

					(0.002%), algae (ascophyllum nodosum, 0.002%), thyme (0.001%), peppermint (0.001%), dandelion (0.001%), parsley (0.001%).	
Cavom Compleet Lamb & Rice	MPHC-adult	Crude Protein 22.0%, Crude Fat 15.0%, Crude Fiber 2.5%, Crude Ash 7.5%, Moisture 7.0%, Calcium 1.0%, Phosphorus 0.8%, Sodium 0.3%, Potassium 0.6%, Magnesium 1100 mg/kg, Manganese 30 mg/kg, Copper 8 mg/kg, Iron 150 mg/kg, Zinc 120 mg/kg, Iodine 1.5 mg/kg, Selenium 0.2 mg/kg.	43%	3550 kcal/kg	Lamb (17%), beef fat (11%), heat-treated rice, minerals, trace elements, natural vitamins, bioactive antioxidants, salmon oil (2%), rapeseed oil (for an optimal Omega 3 and Omega 6 balance), sepiolites, dicalcium phosphate, maltodextrin, sodium, soy (0.6%), and dextrose.	Vitamin A 16000 IU/kg, Vitamin D3 1600 IU/kg, Vitamin B1 16.5 mg/kg, Vitamin B2 16 mg/kg, Vitamin B6 8.5 mg/kg, Vitamin B12 0.045 mg/kg, Vitamin E 300 mg/kg, Vitamin C 150 mg/kg, Vitamin K 3 mg/kg, D-pantothenic acid 27 mg/kg, Nicotinic acid 75 mg/kg, Choline chloride 1750 mg/kg, Folic acid 2.5 mg/kg, Biotin 3 mg/kg.
Josera Family Plus	HPLC-puppy	Protein 30.0%, Crude fat 22.0%, Crude fiber 2.5%, Ash 6.2%, Calcium 1.35%, Phosphorus 0.95%, Magnesium 0.09%, Sodium 0.3%	29.3%	4159 kcal/kg	Poultry protein (dried), rice, whole grain maize, poultry fat, salmon [dried] (6.0%), beet fibre, poultry protein [hydrolysed], vegetable fibres, minerals, chicory root [ground] (natural source of inulin)	Additional nutrients per 1kg: Vitamin A (24,000 IU), Vitamin D3 (1,800 IU), Vitamin E (220 mg), Vitamin B1 (15 mg), Vitamin B2 (20 mg), Vitamin B6 (20 mg), Vitamin B12 (100 mcg), Niacin (90 mg), Pantothenic acid (50 mg), Folic acid (5 mg), Biotin (1,000 mcg), Taurine (1,000 mg), L-Carnitine (200 mg), Vitamin C (200 mg), Iron (220 mg), Zinc (180 mg), Manganese (20 mg), Copper (18 mg), Iodine (2.2 mg), Selenium (0.35 mg).
Josera Kids	MPHC-puppy	Protein 25.0%, Fat 12.0%, Crude fiber 2.3%, Fly ash 6.7%, Calcium 1.30%, Phosphorus 1.00%	44%	3435 kcal/kg	Dried poultry protein, whole grain maize, rice, beet pulp, poultry fat, hydrolysed poultry protein, salmon oil (0.8%), minerals, yeast, ground chicory root (natural source of inulin), dried protein from New Zealand green-lipped mussels (perna canaliculus)	Vitamin A (24,000 IU/kg), Vitamin D3 (1,800 IU/kg), Vitamin E (220 mg/kg), Vitamin B1 (15 mg/kg), Vitamin B2 (20 mg/kg), Vitamin B6 (20 mg/kg), Vitamin B12 (100 mcg/kg), Niacin (90 mg/kg), Pantothenic acid (50 mg/kg), Folic acid (5 mg/kg), Biotin (1,000 mcg/kg), Taurine (1,000 mg/kg), L-Carnitine

						(250 mg/kg), Vitamin C (200 mg/kg), Iron [as ferrous sulphate, monohydrate] (200 mg/kg), Zinc [as glycine zinc chelate, hydrate] (160 mg/kg), Manganese [as manganese(II) oxide] (16 mg/kg), Copper [as glycine copper chelate, hydrate] (20 mg/kg), Iodine [anhydrous calcium iodate] (2 mg/kg), selenium [sodium selenite] (0.25 mg/kg).
Josera Young Star	MPHC-puppy	Protein 25.0%, Fat 13.0%, Crude fiber 2.1%, Fly ash 7.2%, Calcium 1.40%, Phosphorus 0.9%, Sodium 0.45%	42.7%	3475 kcal/kg	Potatoes [dried] (44.0%), poultry protein (dried) (28.0%), poultry fat, beet pulp, locust bean gum, poultry protein [hydrolysed], potato protein, yeast, vegetable protein [hydrolysed], salmon oil (0.8%), minerals, chicory root [ground] (natural source of inulin), green-lipped mussel meat (dried) (perna canaliculus))	Vitamin A (20,000 IU), Vitamin D3 (1,500 IU), Vitamin E (180 mg), Vitamin B1 (10 mg), Vitamin B2 (15 mg), Vitamin B6 (15 mg), Vitamin B12 (90 mcg), Niacin (85 mg), Pantothenic Acid (40 mg), Folic Acid (4 mg), Biotin (800 mcg), Vitamin C (200 mg), Iron (480 mg), Zinc (160 mg), Manganese (16 mg), Copper (20 mg), Iodine (2 mg), Selenium (0.25 mg)
Brit Care Dog Hypoallergenic Puppy Lamb & Rice	HPMC-puppy	Protein 32.0%, Crude fat 18.0%, Crude fiber 1.5%, Ash 7.7%, Calcium 1.4%, Phosphorus 1.1%, Moisture 10.0%, Sodium 0.4%, Omega-3 fatty acids 0.8%, Omega-6 fatty acids 2.2%, Eicosapentaenoic acid 0.05%, Docosahexaenoic acid 0.1%	30.8%	3728 kcal/kg	Dried lamb (42%), rice (30%), chicken fat, salmon oil (3%), brewer's yeast, natural flavouring, dried apple marrow, hydrolysed yeasts (0.5% - source of inositol and amino acids), pea flour, glucosamine (300 mg/kg), fructo-oligo-saccharides (230 mg/kg), chondroitin sulphate (230 mg/kg), mannan-oligo-saccharides (180 mg/kg), mojave yucca (180 mg/kg), milk thistle seed (110 mg/kg), β-glucans (60 mg/kg), dried navelwort (60 mg/kg), dried sea buckthorn (60 mg/kg), probiotic lactobacillus helveticus HA - 122 inactivated (15 x 10 ⁹ cells/kg).	Vitamin A (23,000 IU/kg), Vitamin D3 (1,700 IU/kg), Vitamin E (550 mg/kg), Vitamin C (350 mg/kg), Taurine (1,500 mg/kg), Choline Chloride (1,800 mg/kg kg), L-Carnitine (300 mg/kg), Vitamin B1 (3 mg/kg), Vitamin B2 (11 mg/kg), Biotin (4 mg/kg), Folic Acid (1.4 mg/kg), Vitamin B6 (3 mg/kg), Calcium D-Pantothenate (30 mg/kg), Niacinamide (38 mg/kg), Vitamin B12 (0.12 mg/kg), Iodine (0.9 mg/kg), Organic Zinc (100 mg/kg), Organic Manganese (45 mg/kg), Organic Copper (20 mg/kg), Organic Iron (88

						mg/kg), Organic Selenium (0.18 mg/kg).
Brit Care Grain Free Puppy Salmon & Potato	HPMC-puppy	Protein 30.0%, Crude fat 18.0%, Crude fiber 2.5%, Ash 7.0%, Calcium 1.2%, Phosphorus 0.9%, Moisture 10.0%, Sodium 0.5%, Omega-3 fatty acids 1.3%, Omega-6 fatty acids 2.3%, Eicosapentaenoic acid 0.12%, Docosahexaenoic acid 0.16%	32.5%	3718 kcal/kg	Salmon (55%, dried, hydrolyzed), potato (26%), chicken fat, salmon oil (3%), dried apple marrow, natural flavor, brewer's yeast, hydrolyzed yeast (0.5% - source of inositol and amino acids), pea flour, glucosamine (300 mg/kg), fructo-oligo-saccharides (230 mg/kg), chondroitin sulfate (230 mg/kg), mannan-oligo-saccharides (180 mg/kg), mojave yucca (180 mg/kg), milk thistle seed (110 mg/kg), β-glucans (60 mg/kg), dried prickly pear (60 mg/kg), dried sea buckthorn (60 mg/kg), probiotic lactobacillus helveticus HA - 122 inactivated (15 x 10 ⁹ cells/kg).	Vitamin A (23,000 IU/kg), Vitamin D3 (1,700 IU/kg), Vitamin E (550 mg/kg), Vitamin C (350 mg/kg), Taurine (1,500 mg/kg), Choline Chloride (1,800 mg/kg), L-Carnitine (300 mg/kg), Vitamin B1 (3 mg/kg), Vitamin B2 (11 mg/kg), Biotin (4 mg/kg), Folic Acid (1.4 mg/kg), Vitamin B6 (3 mg/kg), Calcium D-Pantothenate (30 mg/kg), Niacinamide (38 mg/kg), Vitamin B12 (0.12 mg/kg), Iodine (0.9 mg/kg), Organic Zinc (100 mg/kg), Organic Manganese (45 mg/kg), Organic Copper (20 mg/kg), Organic Iron (88 mg/kg), Organic Selenium (0.18 mg/kg).
Brit Care Hypoallergen Dog Show Champion	MPHC-adult	Protein 26.0%, Crude fat 16.0%, Crude fiber 3.0%, ash 5.8%, Calcium 1.1%, Phosphorus 0.9%, Moisture 10.0%, Sodium 0.4%, Omega-3 fatty acids 2.1%, Omega-6 fatty acids 2.2%	39.2%	3642 kcal/kg	Salmon (36%, dried salmon, hydrolyzed salmon), rice (26%), dried herring (14%), chicken fat, linseed (4%), dried apple marrow, salmon oil (3%), natural flavor, brewer's yeast, dried algae (0.5%, Schizochytrium limacinum), pea flour, glucosamine (300 mg/kg), fructo-oligo-saccharides (230 mg/kg), chondroitin sulfate (230 mg/kg), mannan-oligo-saccharides (180 mg/kg), mojave yucca (180 mg/kg), milk thistle seed (110 mg/kg), β-glucans (60 mg/kg), dried prickly pear (60 mg/kg), dried sea buckthorn (60 mg/kg), probiotic lactobacillus helveticus HA - 122 inactivated (15 x 10 ⁹ cells/kg).	Vitamin A (23,000 IU/kg), Vitamin D3 (1,700 IU/kg), Vitamin E (550 mg/kg), Vitamin C (350 mg/kg), Taurine (1,500 mg/kg), Choline Chloride (1,800 mg/kg), L-Carnitine (300 mg/kg), Vitamin B1 (3 mg/kg), Vitamin B2 (11 mg/kg), Biotin (4 mg/kg), Folic Acid (1.4 mg/kg), Vitamin B6 (3 mg/kg), Calcium D-Pantothenate (30 mg/kg), Niacinamide (38 mg/kg), Vitamin B12 (0.12 mg/kg), Iodine (0.9 mg/kg), Organic Zinc (100 mg/kg), Organic Manganese (45 mg/kg), Organic Copper (20 mg/kg), Organic Iron (88 mg/kg), Organic Selenium (0.18 mg/kg).

Josera Geflugel Menu	MPHC-adult	Protein 25.0%, fat content 13.0%, fiber 2.3%, crude ash 6.5%, calcium 1.45%, phosphorus 1.0%, sodium 0.45%, magnesium 0.1%	43.2%	3492 kcal/kg	Whole grain corn, poultry meat meal 29.5%, rice, poultry fat, beet cuttings, poultry protein-hydrolyzed, minerals.	Additional nutrients per 1kg: Vitamin A 13,000 IE, Vitamin D3 1,300, Vitamin E 150mg, Vitamin B1 10mg, Vitamin B2 15mg, Vitamin B6 15mg, Vitamin B12 70mcg, pantothenic acid 35mg, niacinamide 60mg, folic acid 4mg, biotin 650mcg, iron (iron sulfate, monohydrate) 200mg, zinc (zinc chelate glycine, hydrate) 160mg, manganese 16mg, copper (copper glycine chelate, hydrate) 20mg, iodine (calcium iodide) 2mg, selenium 0.25mg.
Not specified	BARF	Not available	Not available	Not specified	Raw food ingredients (specific item names not available)	Not applicable
Gosbi Grain Free Puppy	HPMC-puppy	Crude protein 30.0%, crude fats and oils 19.0%, crude fiber 2.3%, crude ash 7.5%, moisture 9.0%, calcium 1.3%, phosphorus 1.0%, sodium 0.4%, potassium 0.6%, magnesium 0.1%, Omega-3 1.8%, Omega-6 2.3%, glucosamine 1200 mg/kg, chondroitin 900 mg/kg	32.2%	4000 kcal/kg	Dried salmon meat 22%, dried potatoes 14%, salmon oil, dried lamb meat 9%, green peas 9%, fresh salmon meat (8% before extrusion), dried fish meat 7%, fresh lamb meat (5% before extrusion), dried apple marrow 4%, lentils, dried pears 2%, hydrolyzed marine protein, egg powder 1%, vegetable fibers, milk powder, dried carrots 0.4%, dried tomatoes 0.4%, beans 0.4%, dried brewer's yeast, dried pumpkin, dried pineapple 0.2%, potassium chloride + PROVITAL FORMULA 2%, olive oil 0.4%, green-lipped mussels, hydrolyzed crustaceans (natural source of glucosamine), hydrolyzed cartilage (natural source of chondroitin), dried spinach, dried marigold petals (natural source of lutein), dried alfalfa, dried seaweed (spirulina), dried broccoli, dandelion extract, mint leaf extract, green tea seed extract, dried chamomile, lemon extract, grape extract, borage oil, red berries, garlic extract, thyme extract, oregano extract, milk thistle seed extract, yucca extract,	Not specified

					rosemary extract, aloe vera extract, cranberry, FOS, MOS	
Gosbi Exclusive Grain Free Adult Fish Medium	HPMC-adult	Protein 28.0%, fat content 18.0%, crude fibre 2.0%, crude ash 6.9%, moisture 9.0%, calcium 1.2%, phosphorus 1.0%, sodium 0.4%, potassium 0.6%, magnesium 0.1%, omega3: 1.9%, omega6: 2.3%, glucosamine: 1400 mg/kg, chondroitin: 1000 mg/kg.	35.1%	3739 kcal/kg	Dehydrated salmon (22%), dehydrated fish (20%), salmon oil, potato starch (11%), lentils (8%), sweet potato starch (8%), fresh salmon (7% before extrusion), fresh fish (7% before extrusion), dehydrated apple pulp (4%), dehydrated pear (2%), hydrolysed sea proteins, egg powder (1%), vegetal fibre, dehydrated carrot (0,40%), dehydrated tomato (0,40%), beans (0,40%), dried brewer's yeast, dehydrated pineapple (0,2%), potassium chloride + PROVITAL FORMULA (2%): olive oil (0,40%), green-lip mussels, hydrolysed crustaceans (natural source of glucosamine), hydrolysed cartilage (natural source of chondroitin), dehydrated spinach, dried marigold petals (natural source of lutein), dehydrated alfalfa, dehydrated seaweed (spirulina), dehydrated broccoli, extract of dandelion, extract of mint leaves, extract of green tea seed, dried camomile, extract of citric fruits, extract of grape, borage oil, extract of red fruits, extract of garlic, extract of thyme, extract of oregano, extract of milk thistle seed, extract of yucca, extract of rosemary, extract of aloe vera, cranberries, FOS, MOS.	Not specified
Monge Medium Starter	HPLC-puppy	Crude protein: 31.0%, Crude fiber: 1.5%, Crude fat: 22.0%, Crude ash: 7.0%, Calcium: 1.5%, Phosphorus: 1.1%, Calcium/Phosphorus = 1.3, n-3 fatty acids: 0.5%, n-6 fatty acids: 5.5%	28.5%	4500 kcal/kg	Chicken (10% fresh, 32% dehydrated), brown rice (27%), corn, chicken fat, beet pulp, brewer's yeast, corn protein, hydrolyzed chicken liver, oats, whole eggs, salmon, salmon oil, vitamins and minerals, choline chloride, chondroitin and glucosamine, MSM, DL-Methionine, natural chestnut extract, FOS, MOS, yucca extract, spirulina, L-carnitine.	Additives/kg: Vitamin A (retinyl acetate) 30,700 IU, vitamin D3 1,610 IU, vitamin E (all-rac-alpha-tocopheryl acetate) 72 mg, selenium (0.4 mg sodium selenite) 0.2 mg, manganese (manganese sulfate monohydrate 92 mg) 30 mg, zinc (zinc oxide 174 mg) 140 mg, copper (copper (II) sulfate pentahydrate 47 mg) 12 mg, iron (iron (II)-sulfate

						monohydrate 304 mg) 100 mg, iodine (2.4 mg anhydrous calcium iodate), 1.6 mg, L-carnitine: 150 mg, DL-methionine (technically pure): 1500 mg. TECHNOLOGICAL ADDITIVES: Antioxidants: tocopherol extracts from vegetable oils.
Gemon Dog Adult Tuna & Rice	MPHC-adult	Crude protein 25.0%, Crude fat 13.0%, Crude fiber 2.5%, Crude ash 8.0%, Calcium 1.6%, Phosphorus 1.20%	41.50%	3910 kcal/kg	Cereals (rice min. 5%), fish and derivatives (fresh tuna min. 15%), meat and derivatives 27%, oils and fats, vegetable by-products (2% sugar beet pulp), minerals, vitamins, chestnut extract 20 mg/kg, yucca schidigera 0.1%, fructo-oligosaccharides F.O.S. 1%.	Additives/kg: Vitamin A (Retinyl acetate) 24600 IU, Vitamin D3 1290 IU, Vitamin E 58 mg, choline chloride 1500 mg, manganese sulfate monohydrate 70 mg (Manganese 25 mg), zinc oxide 150 mg (Zinc 110 mg), copper sulfate pentahydrate 40 mg (Copper 10 mg), iron sulfate monohydrate 260 mg (Iron 80 mg), sodium selenite 0.35 mg (Selenium 0.15 mg), anhydrous calcium iodate 2.00 mg (Iodine 1.25 mg). Technological additives: Antioxidants.
TeamBreeder Sensitive Puppy	HPMC-puppy	Crude protein 30.0%; crude oils and fats 20.0%; crude fibre 1.9%; crude ash 7.5%; calcium 1.2%; phosphorus 0.9%	30.6%	3821 kcal/kg	Dehydrated fish (38%), rice (38%), fish oil (15%), dried beet pulp (4%), vegetable oil, mono-dicalcium phosphate, sodium chloride, potassium chloride, calcium carbonate, dried brewer's yeast (0.3%)	Vitamin A 12000 IU; Vitamin D3 1200 IU; Vitamin E 120mg; Vitamin C 120mg; Niacin 30mg; Pantothenic acid 12mg; Vitamin B2 6mg; Vitamin B6 4.8mg; Vitamin B1 3.6mg; Vitamin H 0.30mg; Folic acid 0.36mg; Vitamin B12 0.048mg; choline chloride 2500mg; zinc oxide 108mg; zinc sulphate monohydrate 120mg; manganese sulphate monohydrate 150mg; ferrous sulphate monohydrate 44mg; ferrous carbonate 60mg; copper sulphate pentahydrate 50mg; calcium iodate anhydrous 2.4mg; sodium selenite

						0.22mg; DL-methionine 2500mg
TeamBreeder Sensitive Salmon - Lamb	MPHC-adult	Crude protein 23.0%; crude fat 10.0%; crude fiber 2.0%; crude ash 7.0%; calcium 1.2%; phosphorus 0.9%	48%	3423 kcal/kg	Dehydrated lamb protein (28%), rice (28%), corn (23%), chicken fat (6%), dehydrated fish protein, dried beet pulp (4%), dried egg (4%), fish oil (2%), sodium chloride, dried brewer's yeast (0.3%).	Vitamin A 10000 IU; Vitamin D3 1000 IU; Vitamin E 100mg; Vitamin C 100mg; Niacin 25mg; Calcium D-pantothenate 10mg; Vitamin B2 5mg; Vitamin B6 4mg; Vitamin B1 3mg; Biotin 0.25mg; Folic acid 0.30mg; Vitamin B12 0.04mg; Choline chloride 1500mg; Zinc (zinc oxide): 86.7mg; Zinc (zinc sulphate monohydrate): 43.7mg; Manganese (manganese sulphate monohydrate): 48.8mg; Iron (ferrous sulphate monohydrate): 14.5mg; Iron (ferrous carbonate): 28.9mg; Copper (copper sulphate pentahydrate): 12.8mg; iodine (anhydrous calcium iodate): 1.56mg; selenium (sodium selenite): 0.101mg; DL-methionine industrial purity 1500mg.

12.2. Supplementary Data 2

Supplementary Data 2: Analyses Excluded Seven Samples and Exclusion Criteria. These samples are also available under the same ENA BioProject accession **PRJEB82125** but were excluded from our analyses.

ENA bio project accession	ENA sample accession number	Kennel name	Host subject id	Sample title	Exclusion reason
PRJEB82125	ERS22560180	Serteperti	SRTP_E_Ezust	Dog_gut_microbiome_SRTP_E_PM1_210921_Ezust1	Single sample from a unique puppy within the HPLC-puppy group (age 26–52 weeks group), fed a completely different commercial food compared with other puppies in the same age group
PRJEB82125	ERS22560362	Rezerta-Réti	RR_F_Fagyal	Dog_gut_microbiome_RR_F_PF1_240414_Fagyal6	Sample mislabelling (non-recoverable)
PRJEB82125	ERS22560360	Rezerta-Réti	RR_F_Fagyal	Dog_gut_microbiome_RR_F_PF1_240313_Fagyal7	Low gDNA concentration and library yield, resulting in insufficient taxonomic capture
PRJEB82125	ERS22560367	Rezerta-Réti	RR_F_Felho	Dog_gut_microbiome_RR_F_PF2_240313_Felho3	Low gDNA concentration and library yield, resulting in atypical microbial composition compared with related samples
PRJEB82125	ERS22560487	Dunamenti Dumás	DMD_C_Cefre	Dog_gut_microbiome_DMD_C_PM1_220623_Cefre2	Single sample in the project within the BARF diet, and age group 26–52 weeks
PRJEB82125	ERS22560489	Dunamenti Dumás	DMD_C_Cefre	Dog_gut_microbiome_DMD_C_PM1_230303_Cefre5	Microbiome composition markedly different from other samples within the same age group and diet category (BARF)
PRJEB82125	ERS22560440	Dunamenti Dumás	DMD_0_Loki	Dog_gut_microbiome_DMD_0_AM1_220328_Loki5	Microbiome composition markedly different from other samples within the same age group and diet category (BARF)

12.3. Supplementary Data 3

Supplementary Data 3: gDNA and 16S Library Quantity. gDNA concentrations that exceeded the upper detection limit of the Qubit™ dsDNA HS Assay Kit (120 ng/μl) were re-measured after dilution (dilution factors indicated).

Kennel name	Dog name	ENA sample accession number	Sample title	Fecal sample volume (μl)	gDNA concentration (ng/μl)	Dilution factor (for gDNA concentration check)	Total gDNA yield (ng)	16S-Lib. Concentration (ng/μl)
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560115	Dog_gut_microbiome_SRTP_0_AF1_23_0327_Ilka1	750	73		3650	49.6
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560116	Dog_gut_microbiome_SRTP_0_AF1_23_0409_Ilka2	750	78		3900	32.4
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560117	Dog_gut_microbiome_SRTP_0_AF1_23_0425_Ilka3	750	116		5800	48.8
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560118	Dog_gut_microbiome_SRTP_0_AF1_23_0507_Ilka4	750	80.4		4020	53.2
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560119	Dog_gut_microbiome_SRTP_0_AF1_23_0522_Ilka5	750	94.6		4730	30.2
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560120	Dog_gut_microbiome_SRTP_0_AF1_23_0604_Ilka6	750	58.3	5	14575	38.8
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560121	Dog_gut_microbiome_SRTP_0_AF1_23_0621_Ilka7	750	104		5200	40.8
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560122	Dog_gut_microbiome_SRTP_0_AF1_23_1124_Ilka8	750	39.4	5	9850	41
Serteperti	Cuidado Xquisite Xotic "Ilka"	ERS22560123	Dog_gut_microbiome_SRTP_0_AF1_23_1125_Ilka9	750	20	5	5000	43.2
Serteperti	Ludas Matyi Lonci	ERS22560124	Dog_gut_microbiome_SRTP_0_AF2_23_0327_Lonci1	750	94		4700	49
Serteperti	Ludas Matyi Lonci	ERS22560125	Dog_gut_microbiome_SRTP_0_AF2_23_0409_Lonci2	750	119		5950	49.8
Serteperti	Ludas Matyi Lonci	ERS22560126	Dog_gut_microbiome_SRTP_0_AF2_23_0425_Lonci3	750	31.1		1555	34.4
Serteperti	Ludas Matyi Lonci	ERS22560127	Dog_gut_microbiome_SRTP_0_AF2_23_0508_Lonci4	750	100		5000	39.4

Serteperti	Ludas Matyi Lonci	ERS22560128	Dog_gut_microbiome_SRTP_0_AF2_23_0522_Lonci5	750	29	5	7250	53.8
Serteperti	Ludas Matyi Lonci	ERS22560129	Dog_gut_microbiome_SRTP_0_AF2_23_0604_Lonci6	750	116		5800	55.6
Serteperti	Ludas Matyi Lonci	ERS22560130	Dog_gut_microbiome_SRTP_0_AF2_23_0620_Lonci7	750	118		5900	33.8
Serteperti	Ludas Matyi Lonci	ERS22560131	Dog_gut_microbiome_SRTP_0_AF2_23_1124_Lonci8	750	21.2	5	5300	13.5
Serteperti	Ludas Matyi Lonci	ERS22560132	Dog_gut_microbiome_SRTP_0_AF2_23_1125_Lonci9	750	30.8	5	7700	27.4
Serteperti	Ludas Matyi Lonci	ERS22560133	Dog_gut_microbiome_SRTP_0_AF2_23_1130_Lonci10	750	27.8	5	6950	46.4
Serteperti	Serteperti Ajsa	ERS22560134	Dog_gut_microbiome_SRTP_0_AF3_23_0327_Ajsa1	750	97.8		4890	56
Serteperti	Serteperti Ajsa	ERS22560135	Dog_gut_microbiome_SRTP_0_AF3_23_0409_Ajsa2	750	21.2	5	5300	55.8
Serteperti	Serteperti Ajsa	ERS22560136	Dog_gut_microbiome_SRTP_0_AF3_23_0425_Ajsa3	750	114		5700	52
Serteperti	Serteperti Ajsa	ERS22560137	Dog_gut_microbiome_SRTP_0_AF3_23_0507_Ajsa4	750	21.1	5	5275	48.6
Serteperti	Serteperti Ajsa	ERS22560138	Dog_gut_microbiome_SRTP_0_AF3_23_0522_Ajsa5	750	32.9	5	8225	58
Serteperti	Serteperti Ajsa	ERS22560139	Dog_gut_microbiome_SRTP_0_AF3_23_0604_Ajsa6	750	102		5100	53
Serteperti	Serteperti Ajsa	ERS22560140	Dog_gut_microbiome_SRTP_0_AF3_23_0619_Ajsa7	750	118		5900	59.8
Serteperti	Serteperti Ajsa	ERS22560141	Dog_gut_microbiome_SRTP_0_AF3_23_1125_Ajsa8	750	114		5700	33.4
Serteperti	Serteperti Ajsa	ERS22560142	Dog_gut_microbiome_SRTP_0_AF3_23_1130_Ajsa9	750	23.6	5	5900	32.6
Serteperti	Serteperti Bendegúz "Mini"	ERS22560143	Dog_gut_microbiome_SRTP_0_AM4_2_30327_Mini1	750	41.2		2060	44.6
Serteperti	Serteperti Bendegúz "Mini"	ERS22560144	Dog_gut_microbiome_SRTP_0_AM4_2_30408_Mini2	750	28.5	5	7125	61.8
Serteperti	Serteperti Bendegúz "Mini"	ERS22560145	Dog_gut_microbiome_SRTP_0_AM4_2_30425_Mini3	750	60.6		3030	70
Serteperti	Serteperti Bendegúz "Mini"	ERS22560146	Dog_gut_microbiome_SRTP_0_AM4_2_30507_Mini4	750	118		5900	52
Serteperti	Serteperti Bendegúz "Mini"	ERS22560147	Dog_gut_microbiome_SRTP_0_AM4_2_30521_Mini5	750	31.4		1570	54
Serteperti	Serteperti Bendegúz "Mini"	ERS22560148	Dog_gut_microbiome_SRTP_0_AM4_2_30604_Mini6	750	64.8		3240	60.4

Serteperti	Serteperti Bendegúz "Mini"	ERS22560149	Dog_gut_microbiome_SRTP_0_AM4_230620_Mini7	750	90.8		4540	59.2
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560150	Dog_gut_microbiome_SRTP_0_AF4_230327_Rozi1	750	85.2		4260	70.4
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560151	Dog_gut_microbiome_SRTP_0_AF4_230409_Rozi2	750	61.4		3070	70.2
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560152	Dog_gut_microbiome_SRTP_0_AF4_230425_Rozi3	750	35.1	5	8775	64.6
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560153	Dog_gut_microbiome_SRTP_0_AF4_230522_Rozi4	750	110		5500	55.8
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560154	Dog_gut_microbiome_SRTP_0_AF4_230604_Rozi5	750	68.4		3420	58.4
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560155	Dog_gut_microbiome_SRTP_0_AF4_230620_Rozi6	750	106		5300	46
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560156	Dog_gut_microbiome_SRTP_0_AF4_231125_Rozi7	750	57.2	5	14300	23.8
Serteperti	Serteperti Babarózsa "Rozi"	ERS22560157	Dog_gut_microbiome_SRTP_0_AF4_231130_Rozi8	750	28.2	5	7050	22.2
Serteperti	Árkosligeti Kócos Degesz	ERS22560158	Dog_gut_microbiome_SRTP_0_AM1_230327_Degesz1	750	79.6		3980	17.3
Serteperti	Árkosligeti Kócos Degesz	ERS22560159	Dog_gut_microbiome_SRTP_0_AM1_230408_Degesz2	750	31.4		1570	28
Serteperti	Árkosligeti Kócos Degesz	ERS22560160	Dog_gut_microbiome_SRTP_0_AM1_230425_Degesz3	750	48.4		2420	42.2
Serteperti	Árkosligeti Kócos Degesz	ERS22560161	Dog_gut_microbiome_SRTP_0_AM1_230508_Degesz4	750	29.7	5	7425	56
Serteperti	Árkosligeti Kócos Degesz	ERS22560162	Dog_gut_microbiome_SRTP_0_AM1_230521_Degesz5	750	18.8		940	40
Serteperti	Árkosligeti Kócos Degesz	ERS22560163	Dog_gut_microbiome_SRTP_0_AM1_230604_Degesz6	750	76		3800	52
Serteperti	Árkosligeti Kócos Degesz	ERS22560164	Dog_gut_microbiome_SRTP_0_AM1_230620_Degesz7	750	68.4		3420	45.4
Serteperti	Árkosligeti Kócos Degesz	ERS22560165	Dog_gut_microbiome_SRTP_0_AM1_231124_Degesz8	750	47	5	11750	17.5
Serteperti	Inflame's Sampo	ERS22560166	Dog_gut_microbiome_SRTP_0_AM2_230327_Sampo1	750	24.8	5	6200	56.4
Serteperti	Inflame's Sampo	ERS22560167	Dog_gut_microbiome_SRTP_0_AM2_230409_Sampo2	750	87.4		4370	68
Serteperti	Inflame's Sampo	ERS22560168	Dog_gut_microbiome_SRTP_0_AM2_230425_Sampo3	750	53.8		2690	36.4
Serteperti	Inflame's Sampo	ERS22560169	Dog_gut_microbiome_SRTP_0_AM2_230507_Sampo4	750	31.2	5	7800	52.6

Serteperti	Inflame's Sampo	ERS22560170	Dog_gut_microbiome_SRTP_0_AM2_2_30521_Sampo5	750	20.4	5	5100	35.2
Serteperti	Inflame's Sampo	ERS22560171	Dog_gut_microbiome_SRTP_0_AM2_2_30604_Sampo6	750	50.2	5	12550	48.6
Serteperti	Inflame's Sampo	ERS22560172	Dog_gut_microbiome_SRTP_0_AM2_2_30620_Sampo7	750	52.5	5	13125	27.8
Serteperti	Inflame's Sampo	ERS22560173	Dog_gut_microbiome_SRTP_0_AM2_2_31125_Sampo8	750	29.4		1470	42
Serteperti	Napos Hüvelyk Matyi	ERS22560174	Dog_gut_microbiome_SRTP_0_AM3_2_30327_Maty1	750	106		5300	36.4
Serteperti	Napos Hüvelyk Matyi	ERS22560175	Dog_gut_microbiome_SRTP_0_AM3_2_30408_Maty2	750	52.6		2630	14.8
Serteperti	Napos Hüvelyk Matyi	ERS22560176	Dog_gut_microbiome_SRTP_0_AM3_2_30425_Maty3	750	51.3	5	12825	40.6
Serteperti	Napos Hüvelyk Matyi	ERS22560177	Dog_gut_microbiome_SRTP_0_AM3_2_30507_Maty4	750	39.2	5	9800	50.4
Serteperti	Napos Hüvelyk Matyi	ERS22560178	Dog_gut_microbiome_SRTP_0_AM3_2_30605_Maty5	750	116		5800	50.4
Serteperti	Napos Hüvelyk Matyi	ERS22560179	Dog_gut_microbiome_SRTP_0_AM3_2_31125_Maty6	750	26.2	5	6550	32.6
Serteperti	Serteperti Giza	ERS22560181	Dog_gut_microbiome_SRTP_G_PF1_23_0327_Giza1	750	55.8		2790	23.2
Serteperti	Serteperti Giza	ERS22560182	Dog_gut_microbiome_SRTP_G_PF1_23_0409_Giza2	750	60.2		3010	48.6
Serteperti	Serteperti Giza	ERS22560183	Dog_gut_microbiome_SRTP_G_PF1_23_0430_Giza3	750	66.6		3330	32.8
Serteperti	Serteperti Giza	ERS22560184	Dog_gut_microbiome_SRTP_G_PF1_23_0507_Giza4	750	61.8		3090	46
Serteperti	Serteperti Giza	ERS22560185	Dog_gut_microbiome_SRTP_G_PF1_23_0522_Giza5	750	60		3000	40.8
Serteperti	Serteperti Giza	ERS22560186	Dog_gut_microbiome_SRTP_G_PF1_23_0604_Giza6	750	61.8		3090	48.4
Serteperti	Serteperti Giza	ERS22560187	Dog_gut_microbiome_SRTP_G_PF1_23_0620_Giza7	750	71.4		3570	37.8
Serteperti	Serteperti Giza	ERS22560188	Dog_gut_microbiome_SRTP_G_PF1_23_1125_Giza9	750	27.6	5	6900	44.8
Serteperti	Serteperti Giza	ERS22560189	Dog_gut_microbiome_SRTP_G_PF1_23_1130_Giza8	750	30.2	5	7550	21.6
Serteperti	Serteperti Hobó	ERS22560190	Dog_gut_microbiome_SRTP_H_PM1_2_30621_Hobo1	750	106		5300	76
Serteperti	Serteperti Haver	ERS22560191	Dog_gut_microbiome_SRTP_H_PM2_2_30604_Haver2	750	110		5500	52.6

Serteperti	Serteperti Haver	ERS22560192	Dog_gut_microbiome_SRTP_H_PM2_2_30626_Haver3	750	49.1	5	12275	43.4
Serteperti	Serteperti Haver	ERS22560193	Dog_gut_microbiome_SRTP_H_PM2_2_31130_Haver4	750	34	5	8500	46.6
Serteperti	Serteperti Hapsi	ERS22560194	Dog_gut_microbiome_SRTP_H_PM3_2_30604_Hapsi1	750	19.2	5	4800	31
Serteperti	Serteperti Hapsi	ERS22560195	Dog_gut_microbiome_SRTP_H_PM3_2_30622_Hapsi2	750	27.6	5	6900	62
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560196	Dog_gut_microbiome_LPL_0_AF1_230_502_Guba6	750	119		5950	19.9
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560197	Dog_gut_microbiome_LPL_0_AF1_230_512_Guba7	750	114		5700	24.2
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560198	Dog_gut_microbiome_LPL_0_AF1_230_523_Guba5	750	98.6		4930	8.02
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560199	Dog_gut_microbiome_LPL_0_AF1_230_531_Guba2	750	29.8	5	7450	33.2
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560200	Dog_gut_microbiome_LPL_0_AF1_230_603_Guba3	750	12.4		620	41.2
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560201	Dog_gut_microbiome_LPL_0_AF1_230_616_Guba4	750	58	5	14500	36.8
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560202	Dog_gut_microbiome_LPL_0_AF1_230_630_Guba8	750	66.8		3340	19.7
Le Petit Lapin	Duna-menti Dumás Árvíz "Guba"	ERS22560203	Dog_gut_microbiome_LPL_0_AF1_230_729_Guba1	750	35.2	5	8800	32.2
Le Petit Lapin	La Petit Lapin NaMizu "Mizu"	ERS22560204	Dog_gut_microbiome_LPL_0_AM1_230_502_Mizu4	750	33.6	5	8400	58
Le Petit Lapin	La Petit Lapin NaMizu "Mizu"	ERS22560205	Dog_gut_microbiome_LPL_0_AM1_230_512_Mizu2	750	60.8	5	15200	27.6
Le Petit Lapin	La Petit Lapin NaMizu "Mizu"	ERS22560206	Dog_gut_microbiome_LPL_0_AM1_230_523_Mizu5	750	58	5	14500	48.6
Le Petit Lapin	La Petit Lapin NaMizu "Mizu"	ERS22560207	Dog_gut_microbiome_LPL_0_AM1_230_613_Mizu6	750	38.8	5	9700	59.6
Le Petit Lapin	La Petit Lapin NaMizu "Mizu"	ERS22560208	Dog_gut_microbiome_LPL_0_AM1_230_627_Mizu3	750	32.4	5	8100	57.8

Le Petit Lapin	Le Petit Lapin NaMizu "Mizu"	ERS22560209	Dog_gut_microbiome_LPL_0_AM1_230808_Mizu1	750	73.4		3670	53
Le Petit Lapin	Le Petit Lapin Gnocchi	ERS22560210	Dog_gut_microbiome_LPL_P_PF1_230608_Lila1	750	37.2		1860	46
Le Petit Lapin	Le Petit Lapin Gnocchi	ERS22560211	Dog_gut_microbiome_LPL_P_PF1_230622_Lila2	750	67.6		3380	14.2
Le Petit Lapin	Le Petit Lapin Gnocchi	ERS22560212	Dog_gut_microbiome_LPL_P_PF1_230713_Lila6	750	31	5	7750	73.8
Le Petit Lapin	Le Petit Lapin Gnocchi	ERS22560213	Dog_gut_microbiome_LPL_P_PF1_230729_Lila5	750	25.6	5	6400	55.6
Le Petit Lapin	Le Petit Lapin Gnocchi	ERS22560214	Dog_gut_microbiome_LPL_P_PF1_230812_Lila3	750	64.2		3210	61.2
Le Petit Lapin	Le Petit Lapin Gnocchi	ERS22560215	Dog_gut_microbiome_LPL_P_PF1_230826_Lila4	750	25.6	5	6400	50.6
Le Petit Lapin	Le Petit Lapin Farfalle	ERS22560216	Dog_gut_microbiome_LPL_P_PF2_230603_Pink1	750	52.6		2630	44
Le Petit Lapin	Le Petit Lapin Farfalle	ERS22560217	Dog_gut_microbiome_LPL_P_PF2_230611_Pink6	750	30	5	7500	41
Le Petit Lapin	Le Petit Lapin Farfalle	ERS22560218	Dog_gut_microbiome_LPL_P_PF2_230713_Pink8	750	71.6		3580	51
Le Petit Lapin	Le Petit Lapin Farfalle	ERS22560219	Dog_gut_microbiome_LPL_P_PF2_230729_Pink2	750	95.2		4760	42.8
Le Petit Lapin	Le Petit Lapin Farfalle	ERS22560220	Dog_gut_microbiome_LPL_P_PF2_230805_Pink3	750	74.8		3740	45.6
Le Petit Lapin	Le Petit Lapin Farfalle	ERS22560221	Dog_gut_microbiome_LPL_P_PF2_230812_Pink5	750	55.8		2790	57.8
Le Petit Lapin	Le Petit Lapin Farfalle	ERS22560222	Dog_gut_microbiome_LPL_P_PF2_230826_Pink4	750	102		5100	47.4
Le Petit Lapin	Le Petit Lapin Penne	ERS22560223	Dog_gut_microbiome_LPL_P_PF3_230608_Piros1	750	19		950	52.8
Le Petit Lapin	Le Petit Lapin Penne	ERS22560224	Dog_gut_microbiome_LPL_P_PF3_230622_Piros3	750	12.3		615	68
Le Petit Lapin	Le Petit Lapin Penne	ERS22560225	Dog_gut_microbiome_LPL_P_PF3_230713_Piros4	750	118		5900	68
Le Petit Lapin	Le Petit Lapin Penne	ERS22560226	Dog_gut_microbiome_LPL_P_PF3_230729_Piros2	750	89		4450	31.4
Le Petit Lapin	Le Petit Lapin Fusilli	ERS22560227	Dog_gut_microbiome_LPL_P_PM1_230603_Kek6	750	14.6		730	5.1
Le Petit Lapin	Le Petit Lapin Fusilli	ERS22560228	Dog_gut_microbiome_LPL_P_PM1_230608_Kek5	750	9.94		497	54.4
Le Petit Lapin	Le Petit Lapin Fusilli	ERS22560229	Dog_gut_microbiome_LPL_P_PM1_230622_Kek7	750	119		5950	35

Le Petit Lapin	Le Petit Lapin Fusilli	ERS22560230	Dog_gut_microbiome_LPL_P_PM1_230729_Kek4	750	106		5300	74.4
Le Petit Lapin	Le Petit Lapin Fusilli	ERS22560231	Dog_gut_microbiome_LPL_P_PM1_230805_Kek1	750	58.4		2920	52.6
Le Petit Lapin	Le Petit Lapin Fusilli	ERS22560232	Dog_gut_microbiome_LPL_P_PM1_230812_Kek2	750	112		5600	66.4
Le Petit Lapin	Le Petit Lapin Fusilli	ERS22560233	Dog_gut_microbiome_LPL_P_PM1_230813_Kek3	750	42.6	5	10650	80
Le Petit Lapin	Le Petit Lapin Tortellini	ERS22560234	Dog_gut_microbiome_LPL_P_PM2_230603_Zold1	750	22.6		1130	35.2
Le Petit Lapin	Le Petit Lapin Tortellini	ERS22560235	Dog_gut_microbiome_LPL_P_PM2_230608_Zold7	750	17.4		870	40.6
Le Petit Lapin	Le Petit Lapin Tortellini	ERS22560236	Dog_gut_microbiome_LPL_P_PM2_230622_Zold5	750	60		3000	65.4
Le Petit Lapin	Le Petit Lapin Tortellini	ERS22560237	Dog_gut_microbiome_LPL_P_PM2_230723_Zold6	750	45		2250	51.2
Le Petit Lapin	Le Petit Lapin Tortellini	ERS22560238	Dog_gut_microbiome_LPL_P_PM2_230729_Zold2	750	93.4		4670	48
Le Petit Lapin	Le Petit Lapin Tortellini	ERS22560239	Dog_gut_microbiome_LPL_P_PM2_230812_Zold4	750	29.8	5	7450	55
Le Petit Lapin	Le Petit Lapin Tortellini	ERS22560240	Dog_gut_microbiome_LPL_P_PM2_230815_Zold3	750	114		5700	49
Le Petit Lapin	Le Petit Lapin Spanom	ERS22560241	Dog_gut_microbiome_LPL_M_PM1_240506_M_Kek1	750	47.2	5	11800	53.2
Le Petit Lapin	Le Petit Lapin Spanom	ERS22560242	Dog_gut_microbiome_LPL_M_PM1_240510_M_Kek2	750	70.4		3520	29.8
Le Petit Lapin	Le Petit Lapin Spanom	ERS22560243	Dog_gut_microbiome_LPL_M_PF1_240506_M_Lila1	750	43.6	5	10900	51
Le Petit Lapin	Le Petit Lapin Spanom	ERS22560244	Dog_gut_microbiome_LPL_M_PF1_240510_M_Lila2	750	44	5	11000	32.6
Le Petit Lapin	Le Petit Lapin Kincugi	ERS22560245	Dog_gut_microbiome_LPL_M_PF2_240506_M_Narancs1	750	92.2		4610	36.4
Le Petit Lapin	Le Petit Lapin Kincugi	ERS22560246	Dog_gut_microbiome_LPL_M_PF2_240510_M_Narancs2	750	79		3950	40
Le Petit Lapin	Le Petit Lapin Tune	ERS22560247	Dog_gut_microbiome_LPL_M_PF3_240506_M_Piros1	750	33.8	5	8450	29
Le Petit Lapin	Le Petit Lapin Tune	ERS22560248	Dog_gut_microbiome_LPL_M_PF3_240510_M_Piros2	750	53.4	5	13350	55.6
Le Petit Lapin	Le Petit Lapin Maui to Kelemenki	ERS22560249	Dog_gut_microbiome_LPL_M_PF4_240506_M_Rozsaszin1	750	90.2		4510	22.4
Le Petit Lapin	Le Petit Lapin Maui to Kelemenki	ERS22560250	Dog_gut_microbiome_LPL_M_PF4_240510_M_Rozsaszin2	750	36.2	5	9050	44.6

Bükki Cserfes	Poppy	ERS22560251	Dog_gut_microbiome_BKCF_0_AF1_23_0312_Popy1	750	9.72		486	52.2
Bükki Cserfes	Poppy	ERS22560252	Dog_gut_microbiome_BKCF_0_AF1_23_0409_Popy3	750	44.6		2230	44
Bükki Cserfes	Poppy	ERS22560253	Dog_gut_microbiome_BKCF_0_AF1_23_0424_Popy4	750	37.2		1860	44.4
Bükki Cserfes	Poppy	ERS22560254	Dog_gut_microbiome_BKCF_0_AF1_23_0507_Popy5	750	23		1150	40.6
Bükki Cserfes	Poppy	ERS22560255	Dog_gut_microbiome_BKCF_0_AF1_23_0521_Popy9	750	50		2500	45.2
Bükki Cserfes	Poppy	ERS22560256	Dog_gut_microbiome_BKCF_0_AF1_23_0603_Popy2	750	19.7		985	42.8
Bükki Cserfes	Poppy	ERS22560257	Dog_gut_microbiome_BKCF_0_AF1_23_0731_Popy8	750	16.1		805	28.8
Bükki Cserfes	Poppy	ERS22560258	Dog_gut_microbiome_BKCF_0_AF1_23_0911_Popy6	750	21.8		1090	21.6
Bükki Cserfes	Poppy	ERS22560259	Dog_gut_microbiome_BKCF_0_AF1_23_0924_Popy7	750	12.5		625	5.78
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560260	Dog_gut_microbiome_BKCF_0_AF2_23_0312_Cserfes3	750	24.4		1220	4
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560261	Dog_gut_microbiome_BKCF_0_AF2_23_0326_Cserfes5	750	19.9		995	4.46
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560262	Dog_gut_microbiome_BKCF_0_AF2_23_0409_Cserfes1	750	8.86		443	3.18
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560263	Dog_gut_microbiome_BKCF_0_AF2_23_0424_Cserfes14	750	20.8		1040	20.4
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560264	Dog_gut_microbiome_BKCF_0_AF2_23_0507_Cserfes4	750	22.8		1140	3.28
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560265	Dog_gut_microbiome_BKCF_0_AF2_23_0521_Cserfes10	750	37.4		1870	13.3
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560266	Dog_gut_microbiome_BKCF_0_AF2_23_0603_Cserfes2	750	19.2		960	6.62
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560267	Dog_gut_microbiome_BKCF_0_AF2_23_0619_Cserfes15	750	39.2		1960	29.8
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560268	Dog_gut_microbiome_BKCF_0_AF2_23_0720_Cserfes7	750	23		1150	24.2

Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560269	Dog_gut_microbiome_BKCF_0_AF2_23_0731_Cserfes6	750	30	5	7500	6.64
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560270	Dog_gut_microbiome_BKCF_0_AF2_23_0816_Cserfes9	750	31	5	7750	17.2
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560271	Dog_gut_microbiome_BKCF_0_AF2_23_0911_Cserfes8	750	11.9		595	19.5
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560272	Dog_gut_microbiome_BKCF_0_AF2_23_0924_Cserfes13	750	47.6		2380	13.9
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560273	Dog_gut_microbiome_BKCF_0_AF2_23_1010_Cserfes11	750	112		5600	35.8
Bükki Cserfes	Koppánym onostori Fenyves Cserfes	ERS22560274	Dog_gut_microbiome_BKCF_0_AF2_23_1026_Cserfes12	750	44.4		2220	19.9
Bükki Cserfes	Bükki Cserfes Alma	ERS22560275	Dog_gut_microbiome_BKCF_0_AF3_23_0312_Alma4	750	9.92		496	51.8
Bükki Cserfes	Bükki Cserfes Alma	ERS22560276	Dog_gut_microbiome_BKCF_0_AF3_23_0326_Alma8	750	9.42		471	35
Bükki Cserfes	Bükki Cserfes Alma	ERS22560277	Dog_gut_microbiome_BKCF_0_AF3_23_0409_Alma7	750	43		2150	53.4
Bükki Cserfes	Bükki Cserfes Alma	ERS22560278	Dog_gut_microbiome_BKCF_0_AF3_23_0424_Alma2	750	63.6		3180	33.4
Bükki Cserfes	Bükki Cserfes Alma	ERS22560279	Dog_gut_microbiome_BKCF_0_AF3_23_0507_Alma3	750	41.8		2090	42.2
Bükki Cserfes	Bükki Cserfes Alma	ERS22560280	Dog_gut_microbiome_BKCF_0_AF3_23_0521_Alma13	750	16.7		835	35.8
Bükki Cserfes	Bükki Cserfes Alma	ERS22560281	Dog_gut_microbiome_BKCF_0_AF3_23_0603_Alma1	750	70		3500	42
Bükki Cserfes	Bükki Cserfes Alma	ERS22560282	Dog_gut_microbiome_BKCF_0_AF3_23_0619_Alma5	750	50.4		2520	33.8
Bükki Cserfes	Bükki Cserfes Alma	ERS22560283	Dog_gut_microbiome_BKCF_0_AF3_23_0731_Alma10	750	18.4		920	31.2
Bükki Cserfes	Bükki Cserfes Alma	ERS22560284	Dog_gut_microbiome_BKCF_0_AF3_23_0816_Alma6	750	76.6		3830	46.6
Bükki Cserfes	Bükki Cserfes Alma	ERS22560285	Dog_gut_microbiome_BKCF_0_AF3_23_0827_Alma11	750	46.6		2330	48.2
Bükki Cserfes	Bükki Cserfes Alma	ERS22560286	Dog_gut_microbiome_BKCF_0_AF3_23_0911_Alma12	750	16.9		845	46.4
Bükki Cserfes	Bükki Cserfes Alma	ERS22560287	Dog_gut_microbiome_BKCF_0_AF3_23_0924_Alma9	750	37		1850	41.2

Bükki Cserfes	Bükki Cserfes Alma	ERS22560288	Dog_gut_microbiome_BKCF_0_AF3_23_1010_Alma14	750	9.53		476.5	41.8
Bükki Cserfes	Bükki Cserfes Alma	ERS22560289	Dog_gut_microbiome_BKCF_0_AF3_23_1114_Alma15	750	42.2		2110	43.8
Bükki Cserfes	Bükki Cserfes Benge	ERS22560290	Dog_gut_microbiome_BKCF_0_AF4_23_0312_Benge2	750	14.5		725	43
Bükki Cserfes	Bükki Cserfes Benge	ERS22560291	Dog_gut_microbiome_BKCF_0_AF4_23_0326_Benge4	750	8.43		421.5	47
Bükki Cserfes	Bükki Cserfes Benge	ERS22560292	Dog_gut_microbiome_BKCF_0_AF4_23_0409_Benge5	750	25.6		1280	28
Bükki Cserfes	Bükki Cserfes Benge	ERS22560293	Dog_gut_microbiome_BKCF_0_AF4_23_0424_Benge1	750	20.6		1030	47
Bükki Cserfes	Bükki Cserfes Benge	ERS22560294	Dog_gut_microbiome_BKCF_0_AF4_23_0507_Benge11	750	11.8		590	31.8
Bükki Cserfes	Bükki Cserfes Benge	ERS22560295	Dog_gut_microbiome_BKCF_0_AF4_23_0521_Benge12	750	30.8		1540	12.1
Bükki Cserfes	Bükki Cserfes Benge	ERS22560296	Dog_gut_microbiome_BKCF_0_AF4_23_0603_Benge3	750	21.2		1060	34.4
Bükki Cserfes	Bükki Cserfes Benge	ERS22560297	Dog_gut_microbiome_BKCF_0_AF4_23_0619_Benge13	750	20.4		1020	9.2
Bükki Cserfes	Bükki Cserfes Benge	ERS22560298	Dog_gut_microbiome_BKCF_0_AF4_23_0816_Benge6	750	12.1		605	31.2
Bükki Cserfes	Bükki Cserfes Benge	ERS22560299	Dog_gut_microbiome_BKCF_0_AF4_23_0911_Benge8	750	27.6		1380	3.5
Bükki Cserfes	Bükki Cserfes Benge	ERS22560300	Dog_gut_microbiome_BKCF_0_AF4_23_0924_Benge7	750	10.8		540	3.8
Bükki Cserfes	Bükki Cserfes Benge	ERS22560301	Dog_gut_microbiome_BKCF_0_AF4_23_1010_Benge9	750	58.4		2920	4.2
Bükki Cserfes	Bükki Cserfes Benge	ERS22560302	Dog_gut_microbiome_BKCF_0_AF4_23_1026_Benge10	750	33.8		1690	4.36
Bükki Cserfes	Bükki Cserfes Datolya	ERS22560303	Dog_gut_microbiome_BKCF_D_Pf1_23_0720_Datolya1	750	35.4		1770	44.4
Bükki Cserfes	Bükki Cserfes Datolya	ERS22560304	Dog_gut_microbiome_BKCF_D_Pf1230_830_Datolya2	750	19.1		955	36
Bükki Cserfes	Bükki Cserfes Dió	ERS22560305	Dog_gut_microbiome_BKCF_D_PM1_2_30613_Dio1	750	73		3650	50
Bükki Cserfes	Bükki Cserfes Dió	ERS22560306	Dog_gut_microbiome_BKCF_D_PM1_2_30619_Dio2	750	10.4		520	50.6
Bükki Cserfes	Bükki Cserfes Egres	ERS22560307	Dog_gut_microbiome_BKCF_E_Pf1_23_1106_Egres	750	31.7	5	7925	51
Bükki Cserfes	Bükki Cserfes Encian	ERS22560308	Dog_gut_microbiome_BKCF_E_Pf2_23_1106_Encian	750	74.6		3730	31.6

Bükki Cserfes	Bükki Cserfes Eben	ERS22560309	Dog_gut_microbiome_BKCF_E_PM1_231106_Eben	750	20.2		1010	16.3
Bükki Cserfes	Bükki Cserfes Eszakisas	ERS22560310	Dog_gut_microbiome_BKCF_E_PM2_231106_Eszakisas	750	100		5000	63.2
Bükki Cserfes	Bükki Cserfes Edeskomeny	ERS22560311	Dog_gut_microbiome_BKCF_E_PM3_231112_Edeskomeny	750	8.12		406	43
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560312	Dog_gut_microbiome_RR_0_AF1_230112_Anna4	750	76		3800	63.2
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560313	Dog_gut_microbiome_RR_0_AF1_230114_Anna1	750	36.8		1840	49.2
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560314	Dog_gut_microbiome_RR_0_AF1_230129_Anna2	750	29.8		1490	50.8
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560315	Dog_gut_microbiome_RR_0_AF1_230225_Anna6	750	47.2	5	11800	40.2
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560316	Dog_gut_microbiome_RR_0_AF1_230308_Anna3	750	106		5300	45.6
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560317	Dog_gut_microbiome_RR_0_AF1_230312_Anna5	750	85.9		4295	46
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560318	Dog_gut_microbiome_RR_0_AF1_230325_Anna7	750	57.2	5	14300	25.6
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560319	Dog_gut_microbiome_RR_0_AF1_230423_Anna8	750	57	5	14250	39.6
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560320	Dog_gut_microbiome_RR_0_AF1_240318_Anna10	750	73.2		3660	56
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560321	Dog_gut_microbiome_RR_0_AF1_240413_Anna9	750	91.4		4570	20.8
Rezerta-Réti	Emese Álma Becsú "Anna"	ERS22560322	Dog_gut_microbiome_RR_0_AF1_240428_Anna11	750	27	5	6750	24.8
Rezerta-Réti	Emese Álma Becsú "Hanga"	ERS22560323	Dog_gut_microbiome_RR_0_AF2_230105_Hanga1	750	37.4		1870	50.2
Rezerta-Réti	Emese Álma Becsú "Hanga"	ERS22560324	Dog_gut_microbiome_RR_0_AF2_230114_Hanga2	750	119		5950	44
Rezerta-Réti	Emese Álma	ERS22560325	Dog_gut_microbiome_RR_0_AF2_230128_Hanga5	750	15.5		775	35.4

	Becsú "Hanga"							
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560326	Dog_gut_microbiom e_RR_0_AF2_2302 12_Hanga8	750	30.4	5	7600	62.4
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560327	Dog_gut_microbiom e_RR_0_AF2_2302 24_Hanga9	750	31.2	5	7800	47.8
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560328	Dog_gut_microbiom e_RR_0_AF2_2302 25_Hanga6	750	44.2	5	11050	42.8
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560329	Dog_gut_microbiom e_RR_0_AF2_2303 12_Hanga7	750	117		5850	40.2
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560330	Dog_gut_microbiom e_RR_0_AF2_2303 25_Hanga3	750	38.8	5	9700	47.2
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560331	Dog_gut_microbiom e_RR_0_AF2_2304 08_Hanga4	750	47.4	5	11850	44.8
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560332	Dog_gut_microbiom e_RR_0_AF2_2304 23_Hanga10	750	93		4650	52.5
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560333	Dog_gut_microbiom e_RR_0_AF2_2305 07_Hanga11	750	28.2	5	7050	47.7
Rezerta- Réti	Emese Álma Becsú "Hanga"	ERS22560334	Dog_gut_microbiom e_RR_0_AF2_2404 13_Hanga12	750	88		4400	12
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560335	Dog_gut_microbiom e_RR_0_AF3_2301 14_Cinke3	750	39	5	9750	60.4
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560336	Dog_gut_microbiom e_RR_0_AF3_2301 25_Cinke4	750	104		5200	57.4
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560337	Dog_gut_microbiom e_RR_0_AF3_2302 12_Cinke1	750	31	5	7750	53.2
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560338	Dog_gut_microbiom e_RR_0_AF3_2302 25_Cinke6	750	54.6	5	13650	14.7
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560339	Dog_gut_microbiom e_RR_0_AF3_2303 12_Cinke5	750	46.2	5	11550	65
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560340	Dog_gut_microbiom e_RR_0_AF3_2303 25_Cinke9	750	38.6	5	9650	62.7
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560341	Dog_gut_microbiom e_RR_0_AF3_2304 08_Cinke2	750	49.2		2460	64.8
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560342	Dog_gut_microbiom e_RR_0_AF3_2304 23_Cinke7	750	36.8	5	9200	41.4
Rezerta- Réti	Rezerta- Réti Cinke	ERS22560343	Dog_gut_microbiom e_RR_0_AF3_2305 07_Cinke8	750	61.4		3070	31.2

Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560344	Dog_gut_microbiome_RR_0_AM1_230115_Perec4	750	58.8	5	14700	61.8
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560345	Dog_gut_microbiome_RR_0_AM1_230129_Perec1	750	33.8	5	8450	32.2
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560346	Dog_gut_microbiome_RR_0_AM1_230212_Perec2	750	89		4450	63.2
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560347	Dog_gut_microbiome_RR_0_AM1_230225_Perec5	750	37.8	5	9450	41.4
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560348	Dog_gut_microbiome_RR_0_AM1_230312_Perec3	750	87.8		4390	75.2
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560349	Dog_gut_microbiome_RR_0_AM1_230325_Perec7	750	83.6		4180	20.1
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560350	Dog_gut_microbiome_RR_0_AM1_230408_Perec6	750	40.6	5	10150	49.8
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560351	Dog_gut_microbiome_RR_0_AM1_230423_Perec8	750	33.4	5	8350	12.66
Rezerta-Réti	Imse-Vimse Foxtrot "Perec"	ERS22560352	Dog_gut_microbiome_RR_0_AM1_230521_Perec9	750	34.6	5	8650	19.6
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560353	Dog_gut_microbiome_RR_F_PF1_230322_Fagyal8	750	80.6		4030	25.4
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560354	Dog_gut_microbiome_RR_F_PF1_230330_Fagyal10	750	106		5300	22.6
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560355	Dog_gut_microbiome_RR_F_PF1_230408_Fagyal9	750	33.2		1660	39.2
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560356	Dog_gut_microbiome_RR_F_PF1_230423_Fagyal4	750	26.2		1310	33.2
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560357	Dog_gut_microbiome_RR_F_PF1_230507_Fagyal5	750	78		3900	29.4
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560358	Dog_gut_microbiome_RR_F_PF1_230521_Fagyal11	750	116		5800	62.4
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560359	Dog_gut_microbiome_RR_F_PF1_240227_Fagyal2	750	104		5200	55.4
Rezerta-Réti	Rezerta-Réti Fagyal	ERS22560361	Dog_gut_microbiome_RR_F_PF1_240414_Fagyal3	750	90.4		4520	39.6
Rezerta-Réti	Rezerta-Réti Felhő	ERS22560363	Dog_gut_microbiome_RR_F_PF2_230308_Felho6	750	84.2		4210	27.4

Rezerta-Réti	Rezerta-Réti Felhő	ERS22560364	Dog_gut_microbiome_RR_F_PF2_2303_25_Felho4	750	42.4		2120	33.2
Rezerta-Réti	Rezerta-Réti Felhő	ERS22560365	Dog_gut_microbiome_RR_F_PF2_2303_30_Felho5	750	100		5000	14.5
Rezerta-Réti	Rezerta-Réti Felhő	ERS22560366	Dog_gut_microbiome_RR_F_PF2_2304_23_Felho1	750	22.2	5	5550	58.8
Rezerta-Réti	Rezerta-Réti Felhő	ERS22560368	Dog_gut_microbiome_RR_F_PF2_2404_14_Felho2	750	104		5200	27.6
Rezerta-Réti	Rezerta-Réti Felhő	ERS22560369	Dog_gut_microbiome_RR_F_PF2_2404_28_Felho7	750	23.8	5	5950	35.8
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560370	Dog_gut_microbiome_RR_F_PM1_2304_08_Fasli7	750	106		5300	17.1
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560371	Dog_gut_microbiome_RR_F_PM1_2304_23_Fasli4	750	73.2		3660	53
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560372	Dog_gut_microbiome_RR_F_PM1_2305_07_Fasli2	750	94.4		4720	33.9
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560373	Dog_gut_microbiome_RR_F_PM1_2305_21_Fasli3	750	29.8	5	7450	27.6
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560374	Dog_gut_microbiome_RR_F_PM1_2308_26_Fasli1	750	57.4		2870	29.6
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560375	Dog_gut_microbiome_RR_F_PM1_2404_04_Fasli5	750	69.2		3460	21
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560376	Dog_gut_microbiome_RR_F_PM1_2404_14_Fasli6	750	98.6		4930	83.8
Rezerta-Réti	Rezeta-Réti Fásli "Magor"	ERS22560377	Dog_gut_microbiome_RR_F_PM1_2404_28_Fasli8	750	79.4		3970	47.6
Rezerta-Réti	Rezeta-Réti Fecni	ERS22560378	Dog_gut_microbiome_RR_F_PM2_2303_30_Fecni1	750	19	5	4750	12.8
Rezerta-Réti	Rezeta-Réti Fecni	ERS22560379	Dog_gut_microbiome_RR_F_PM2_2304_02_Fecni3	750	106		5300	32.1
Rezerta-Réti	Rezeta-Réti Fecni	ERS22560380	Dog_gut_microbiome_RR_F_PM2_2304_08_Fecni2	750	25.2	5	6300	36.2
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560381	Dog_gut_microbiome_RR_F_PM3_2303_20_Fagy5	750	74		3700	18.2
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560382	Dog_gut_microbiome_RR_F_PM3_2303_26_Fagy4	750	22	5	5500	17
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560383	Dog_gut_microbiome_RR_F_PM3_2304_08_Fagy2	750	65.4		3270	44.2
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560384	Dog_gut_microbiome_RR_F_PM3_2304_23_Fagy1	750	118		5900	36.2
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560385	Dog_gut_microbiome_RR_F_PM3_2305_07_Fagy7	750	18.5		925	33

Rezerta-Réti	Rezeta-Réti Fagy	ERS22560386	Dog_gut_microbiome_RR_F_PM3_230521_Fagy13	750	31.6	5	7910	45.6
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560387	Dog_gut_microbiome_RR_F_PM3_230603_Fagy6	750	42.4		2120	31.2
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560388	Dog_gut_microbiome_RR_F_PM3_230816_Fagy8	750	28		1400	31.2
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560389	Dog_gut_microbiome_RR_F_PM3_230827_Fagy9	750	20.2		1010	26.2
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560390	Dog_gut_microbiome_RR_F_PM3_230911_Fagy11	750	18.1		905	31.6
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560391	Dog_gut_microbiome_RR_F_PM3_230924_Fagy10	750	32		1600	49.6
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560392	Dog_gut_microbiome_RR_F_PM3_231026_Fagy12	750	23.2		1160	21.6
Rezerta-Réti	Rezeta-Réti Fagy	ERS22560393	Dog_gut_microbiome_RR_F_PM3_240428_Fagy3	750	20.6	5	5150	35.6
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560394	Dog_gut_microbiome_RR_F_PM4_230308_Fodor8	750	25.2	5	6300	52.6
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560395	Dog_gut_microbiome_RR_F_PM4_230320_Fodor7	750	27.4		1370	12.2
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560396	Dog_gut_microbiome_RR_F_PM4_230330_Fodor9	750	46.2		2310	17.7
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560397	Dog_gut_microbiome_RR_F_PM4_230507_Fodor1	750	108		5400	54.6
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560398	Dog_gut_microbiome_RR_F_PM4_240318_Fodor3	750	9.13		456.5	37.8
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560399	Dog_gut_microbiome_RR_F_PM4_240327_Fodor5	750	19.1		955	42.8
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560400	Dog_gut_microbiome_RR_F_PM4_240331_Fodor6	750	104		5200	22
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560401	Dog_gut_microbiome_RR_F_PM4_240408_Fodor10	750	24.4		1220	17.9
Rezerta-Réti	Rezeta-Réti Fodor	ERS22560402	Dog_gut_microbiome_RR_F_PM4_240414_Fodor4	750	15.4		770	50
Rezerta-Réti	Rezeta-Réti Galagonya	ERS22560403	Dog_gut_microbiome_RR_G_PF1_240316_Galagonya2	750	26.2		1310	15.5
Rezerta-Réti	Rezeta-Réti Galagonya	ERS22560404	Dog_gut_microbiome_RR_G_PF1_240413_Galagonya1	750	99		4950	40.4
Rezerta-Réti	Rezeta-Réti Gyöngy	ERS22560405	Dog_gut_microbiome_RR_G_PF2_240326_Gyongy2	750	30.6		1530	35.8
Rezerta-Réti	Rezeta-Réti Gyöngy	ERS22560406	Dog_gut_microbiome_RR_G_PF2_240413_Gyongy1	750	66.8		3340	23

Rezerta-Réti	Rezerta-Réti Grafit	ERS22560407	Dog_gut_microbiome_RR_G_PM1_240320_Grafit3	750	49.4		2470	53.2
Rezerta-Réti	Rezerta-Réti Grafit	ERS22560408	Dog_gut_microbiome_RR_G_PM1_240404_Grafit1	750	15.4		770	13.4
Rezerta-Réti	Rezerta-Réti Grafit	ERS22560409	Dog_gut_microbiome_RR_G_PM1_240414_Grafit2	750	75.2		3760	33.2
Rezerta-Réti	Rezerta-Réti Grafit	ERS22560410	Dog_gut_microbiome_RR_G_PM1_240428_Grafit4	750	26	5	6500	28.8
Rezerta-Réti	Rezeta-Réti Garas	ERS22560411	Dog_gut_microbiome_RR_G_PM2_240313_Garas2	750	9.64		482	66.4
Rezerta-Réti	Rezeta-Réti Garas	ERS22560412	Dog_gut_microbiome_RR_G_PM2_240401_Garas3	750	40.6		2030	30.4
Rezerta-Réti	Rezeta-Réti Garas	ERS22560413	Dog_gut_microbiome_RR_G_PM2_240414_Garas1	750	39.8	5	9950	17.9
Rezerta-Réti	Rezeta-Réti Gróf	ERS22560414	Dog_gut_microbiome_RR_G_PM3_240324_Grofl	750	39.4		1970	37.6
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560415	Dog_gut_microbiome_DMD_0_AF1_211017_Sugo_N9	750	34.8		1740	12.3
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560416	Dog_gut_microbiome_DMD_0_AF1_211103_Sugo_N4	750	115		5750	22.8
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560417	Dog_gut_microbiome_DMD_0_AF1_211106_Sugo_N5	750	23.1		1155	36.8
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560418	Dog_gut_microbiome_DMD_0_AF1_211111_Sugo_N6	750	110		5500	66
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560419	Dog_gut_microbiome_DMD_0_AF1_220328_Sugo6	750	118		5900	49.8
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560420	Dog_gut_microbiome_DMD_0_AF1_230102_Sugo10	750	99		4950	33.2
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560421	Dog_gut_microbiome_DMD_0_AF1_230115_Sugo11	750	62.3	5	15575	54.6
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560422	Dog_gut_microbiome_DMD_0_AF1_230128_Sugo7	750	71.2		3560	43
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560423	Dog_gut_microbiome_DMD_0_AF1_230210_Sugo8	750	31.2	5	7800	23.8
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560424	Dog_gut_microbiome_DMD_0_AF1_230225_Sugo9	750	63.6	5	15900	52.2
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560425	Dog_gut_microbiome_DMD_0_AF1_230312_Sugo4	750	46.8	5	11700	52.8
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560426	Dog_gut_microbiome_DMD_0_AF1_230321_Sugo1	750	37.1	5	9275	46.8
Duna-menti Dumás	Galla-Hegyí Suba "Sugó"	ERS22560427	Dog_gut_microbiome_DMD_0_AF1_230407_Sugo2	750	25.1	5	6275	59.6

Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560428	Dog_gut_microbiome_DMD_0_AF1_23_0407_Sugo5	750	30.8	5	7700	42.2
Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560429	Dog_gut_microbiome_DMD_0_AF1_23_0420_Sugo3	750	114		5700	34.2
Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560430	Dog_gut_microbiome_DMD_0_AF1_23_0521_Sugo_N7	750	117		5850	42.8
Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560431	Dog_gut_microbiome_DMD_0_AF1_23_0531_Sugo_N2	750	116		5800	43.4
Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560432	Dog_gut_microbiome_DMD_0_AF1_23_0616_Sugo_N3	750	115		5950	53
Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560433	Dog_gut_microbiome_DMD_0_AF1_24_0615_Sugo_N1	750	108		5400	39.4
Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560434	Dog_gut_microbiome_DMD_0_AF1_24_0709_Sugo_N8	750	52		2600	41
Duna-menti Dumás	Galla-Hegy Suba "Sugó"	ERS22560435	Dog_gut_microbiome_DMD_0_AF1_24_0722_Sugo_N10	750	59.8	5	14950	30.6
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560436	Dog_gut_microbiome_DMD_0_AM1_21_0513_Loki4	750	25.1	5	6275	63.8
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560437	Dog_gut_microbiome_DMD_0_AM1_21_1101_Loki_N4	750	114		8200	32.8
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560438	Dog_gut_microbiome_DMD_0_AM1_21_1110_Loki_N5	750	90.1		4505	39.2
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560439	Dog_gut_microbiome_DMD_0_AM1_21_1128_Loki_N7	750	117		5850	28
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560441	Dog_gut_microbiome_DMD_0_AM1_23_0102_Loki7	750	97.2		4860	21.6
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560442	Dog_gut_microbiome_DMD_0_AM1_23_0114_Loki8	750	63.5	5	15875	29
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560443	Dog_gut_microbiome_DMD_0_AM1_23_0128_Loki9	750	31	5	7750	34
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560444	Dog_gut_microbiome_DMD_0_AM1_23_0211_Loki6	750	42	5	10500	27.8
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560445	Dog_gut_microbiome_DMD_0_AM1_23_0310_Loki3	750	40.1	5	10025	53.8
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560446	Dog_gut_microbiome_DMD_0_AM1_23_0407_Loki1	750	31.2	5	7800	59.6
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560447	Dog_gut_microbiome_DMD_0_AM1_23_0420_Loki2	750	17.6	5	4400	52
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560448	Dog_gut_microbiome_DMD_0_AM1_23_0521_Loki_N6	750	115		8250	48
Duna-menti Dumás	Kondacsipkédő Lidérc "Loki"	ERS22560449	Dog_gut_microbiome_DMD_0_AM1_23_0531_Loki_N2	750	118		5900	45

Duna-menti Dumás	Kondacsipk edő Lidérc "Loki"	ERS22560450	Dog_gut_microbiome_DMD_0_AM1_23_0616_Loki_N3	750	117		5850	39.8
Duna-menti Dumás	Kondacsipk edő Lidérc "Loki"	ERS22560451	Dog_gut_microbiome_DMD_0_AM1_24_0616_Loki_N1	750	31.8	10	15900	42.8
Duna-menti Dumás	Kondacsipk edő Lidérc "Loki"	ERS22560452	Dog_gut_microbiome_DMD_0_AM1_24_0709_Loki_N8	750	105		5250	29.2
Duna-menti Dumás	Kondacsipk edő Lidérc "Loki"	ERS22560453	Dog_gut_microbiome_DMD_0_AM1_24_0722_Loki_N9	750	68.5		3425	32.8
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560454	Dog_gut_microbiome_DMD_B_Pf1_21_0509_Boszi5	750	56.8		2840	70
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560455	Dog_gut_microbiome_DMD_B_Pf1_21_1017_Boszi_N6	750	64.4		3220	25.8
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560456	Dog_gut_microbiome_DMD_B_Pf1_21_1101_Boszi_N8	750	14.8		740	24.4
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560457	Dog_gut_microbiome_DMD_B_Pf1_21_1106_Boszi_N9	750	116		5800	33
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560458	Dog_gut_microbiome_DMD_B_Pf1_22_0328_Boszi7	750	37	5	9250	54.6
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560459	Dog_gut_microbiome_DMD_B_Pf1_23_0102_Boszi6	750	54.9	5	13725	25
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560460	Dog_gut_microbiome_DMD_B_Pf1_23_0114_Boszi9	750	25.2	5	6300	52
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560461	Dog_gut_microbiome_DMD_B_Pf1_23_0126_Boszi10	750	55.1	5	13775	60.4
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560462	Dog_gut_microbiome_DMD_B_Pf1_23_0128_Boszi8	750	57.4	5	14350	74.8
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560463	Dog_gut_microbiome_DMD_B_Pf1_23_0210_Boszi11	750	16.1	5	4025	51
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560464	Dog_gut_microbiome_DMD_B_Pf1_23_0321_Boszi1	750	18	5	4500	44.8
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560465	Dog_gut_microbiome_DMD_B_Pf1_23_0407_Boszi4	750	31.4	5	7850	48.2
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560466	Dog_gut_microbiome_DMD_B_Pf1_23_0418_Boszi2	750	28.2	5	7050	46.4
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560467	Dog_gut_microbiome_DMD_B_Pf1_23_0420_Boszi3	750	18.2	5	4550	70.8
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560468	Dog_gut_microbiome_DMD_B_Pf1_23_0521_Boszi_N3	750	56.3	5	14075	46.4
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560469	Dog_gut_microbiome_DMD_B_Pf1_23_0531_Boszi_N4	750	63.2	5	15800	34.2
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560470	Dog_gut_microbiome_DMD_B_Pf1_23_0616_Boszi_N5	750	61.5	5	15375	43.6

Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560471	Dog_gut_microbiome_DMD_B_PF1_24_0530_Boszi_N1	750	104		5200	94.6
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560472	Dog_gut_microbiome_DMD_B_PF1_24_0614_Boszi_N2	750	44.6	5	11150	34.8
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560473	Dog_gut_microbiome_DMD_B_PF1_24_0710_Boszi_N7	750	62.8	5	15700	19.2
Duna-menti Dumás	Duna-menti Dumás Boszi	ERS22560474	Dog_gut_microbiome_DMD_B_PF1_24_0722_Boszi_N10	750	61.6	5	15400	19.3
Duna-menti Dumás	Duna-menti Dumás Borcsa	ERS22560475	Dog_gut_microbiome_DMD_B_PF2_21_0504_Borcsa1	750	68.6		3430	77.4
Duna-menti Dumás	Duna-menti Dumás Blöff	ERS22560476	Dog_gut_microbiome_DMD_B_PM1_21_0504_Bloff1	750	73.8		3690	79.4
Duna-menti Dumás	Duna-menti Dumás Blöff	ERS22560477	Dog_gut_microbiome_DMD_B_PM1_21_0509_Bloff2	750	84.6		4230	74.4
Duna-menti Dumás	Duna-menti Dumás Briós	ERS22560478	Dog_gut_microbiome_DMD_B_PM2_21_0405_Brios1	750	67.2		3360	71.6
Duna-menti Dumás	Duna-menti Dumás Briós	ERS22560479	Dog_gut_microbiome_DMD_B_PM2_21_0505_Brios2	750	82.8		4140	104
Duna-menti Dumás	Duna-menti Dumás Csepke	ERS22560480	Dog_gut_microbiome_DMD_C_PF1_23_0303_Csepke1	750	9.53		476.5	36.8
Duna-menti Dumás	Duna-menti Dumás Csepke	ERS22560481	Dog_gut_microbiome_DMD_C_PF1_23_0304_Csepke2	750	15.3		765	41.8
Duna-menti Dumás	Duna-menti Dumás Csepke	ERS22560482	Dog_gut_microbiome_DMD_C_PF1_23_0704_Csepke4	750	8.84		442	41.8
Duna-menti Dumás	Duna-menti Dumás Csibe "Rozi"	ERS22560483	Dog_gut_microbiome_DMD_C_PF2_22_0624_Csibe1	750	112		5600	66
Duna-menti Dumás	Duna-menti Dumás Csibe "Rozi"	ERS22560484	Dog_gut_microbiome_DMD_C_PF2_22_1218_Csibe2	750	62.4		3120	84
Duna-menti Dumás	Duna-menti Dumás Csibe "Rozi"	ERS22560485	Dog_gut_microbiome_DMD_C_PF2_23_0514_Csibe_N1	750	62.2	5	15550	28.2
Duna-menti Dumás	Duna-menti Dumás Cefre "Beni"	ERS22560486	Dog_gut_microbiome_DMD_C_PM1_22_0303_Cefre1	750	53		2650	99.2
Duna-menti Dumás	Duna-menti Dumás Cefre "Beni"	ERS22560488	Dog_gut_microbiome_DMD_C_PM1_22_1222_Cefre3	750	85		4250	94.8
Duna-menti Dumás	Duna-menti Dumás Cefre "Beni"	ERS22560490	Dog_gut_microbiome_DMD_C_PM1_23_0701_Cefre4	750	18.2		910	18.6
Duna-menti Dumás	Duna-menti Dumás Csúzli	ERS22560491	Dog_gut_microbiome_DMD_C_PM2_22_0303_Csuzli1	750	41.9	5	10475	53.4

Duna-menti Dumás	Duna-menti Dumás Csúzli	ERS22560492	Dog_gut_microbiome_DMD_C_PM2_22_0630_Csuzli4	750	39.2		1960	23
Duna-menti Dumás	Duna-menti Dumás Csúzli	ERS22560493	Dog_gut_microbiome_DMD_C_PM2_22_1225_Csuzli2	750	35.15	5	8787.5	38
Duna-menti Dumás	Duna-menti Dumás Csúzli	ERS22560494	Dog_gut_microbiome_DMD_C_PM2_23_0526_Csuzli3	750	104		5200	48.6
Duna-menti Dumás	Duna-menti Dumás Coca "Pusta"	ERS22560495	Dog_gut_microbiome_DMD_C_PM3_22_0316_Coca1	750	9.16		458	39.8
Duna-menti Dumás	Duna-menti Dumás Coca "Pusta"	ERS22560496	Dog_gut_microbiome_DMD_C_PM3_22_1222_Coca2	750	68.7		3435	45.4
Duna-menti Dumás	Duna-menti Dumás Dívá	ERS22560497	Dog_gut_microbiome_DMD_D_PF1_23_0414_Diva1	750	36.3	5	9075	58.6
Duna-menti Dumás	Duna-menti Dumás Dögös "Piros"	ERS22560498	Dog_gut_microbiome_DMD_D_PF2_23_0416_Piros_1	750	58	5	14500	69.4
Duna-menti Dumás	Duna-menti Dumás Dögös "Piros"	ERS22560499	Dog_gut_microbiome_DMD_D_PF2_23_0521_Piros_N3	750	31.4	10	15700	47
Duna-menti Dumás	Duna-menti Dumás Dögös "Piros"	ERS22560500	Dog_gut_microbiome_DMD_D_PF2_23_0531_Piros_N4	750	22.3	10	11150	27.4
Duna-menti Dumás	Duna-menti Dumás Dögös "Piros"	ERS22560501	Dog_gut_microbiome_DMD_D_PF2_23_0616_Piros_N5	750	28.7	10	14350	53.2
Duna-menti Dumás	Duna-menti Dumás Dögös "Piros"	ERS22560502	Dog_gut_microbiome_DMD_D_PF2_23_0722_Piros_N6	750	24.6	10	12300	37.4
Duna-menti Dumás	Duna-menti Dumás Dögös "Piros"	ERS22560503	Dog_gut_microbiome_DMD_D_PF2_24_0615_Piros_N1	750	29.9	10	14950	36.4
Duna-menti Dumás	Duna-menti Dumás Dögös "Piros"	ERS22560504	Dog_gut_microbiome_DMD_D_PF2_24_0709_Piros_N2	750	31.8	10	15900	29.6
Duna-menti Dumás	Duna-menti Dumás Dilis	ERS22560505	Dog_gut_microbiome_DMD_D_PM1_2_30413_Dilis1	750	52.4		2620	55.2
Duna-menti Dumás	Duna-menti Dumás Doki	ERS22560506	Dog_gut_microbiome_DMD_D_PM2_2_30413_Doki1	750	23.6		1180	44.6
Duna-menti Dumás	Duna-menti Dumás Dutyi	ERS22560507	Dog_gut_microbiome_DMD_D_PM3_2_30417_Dutyi1	750	21.4		1070	27
Duna-menti Dumás	Duna-menti Dumás Dettó	ERS22560508	Dog_gut_microbiome_DMD_D_PM4_2_30416_Detto1	750	45.6	5	11400	50
Duna-menti Dumás	Duna-menti Dumás Elmés	ERS22560509	Dog_gut_microbiome_DMD_E_PM1_24_0618_Neon_N1	750	14.7	10	7350	38.8

Duna-menti Dumás	Duna-menti Dumás Elmés	ERS22560510	Dog_gut_microbiome_DMD_E_PM1_24_0622_Neon_N2	750	24.6	10	12300	33.8
Duna-menti Dumás	Duna-menti Dumás Elmés	ERS22560511	Dog_gut_microbiome_DMD_E_PM1_24_0710_Neon_N3	750	30.3	10	15150	37.8
Duna-menti Dumás	Duna-menti Dumás Elmés	ERS22681303	Dog_gut_microbiome_DMD_E_PM1_24_0722_Neon_N4	750	17	10	8500	42.4
Duna-menti Dumás	Duna-menti Dumás Elnök	ERS22560512	Dog_gut_microbiome_DMD_E_PM2_24_0616_Turkiz_N4	750	14.7		735	73.6
Duna-menti Dumás	Duna-menti Dumás Elnök	ERS22560513	Dog_gut_microbiome_DMD_E_PM2_24_0624_Turkiz_N1	750	19.2	10	9600	34.6
Duna-menti Dumás	Duna-menti Dumás Elnök	ERS22560514	Dog_gut_microbiome_DMD_E_PM2_24_0711_Turkiz_N2	750	15.3	10	7650	27.4
Duna-menti Dumás	Duna-menti Dumás Elnök	ERS22560515	Dog_gut_microbiome_DMD_E_PM2_24_0722_Turkiz_N3	750	18.1	10	9050	27
Duna-menti Dumás	Duna-menti Dumás Élet	ERS22560516	Dog_gut_microbiome_DMD_E_PF1_24_0615_Citrom_N1	750	9.68		484	42.6
Duna-menti Dumás	Duna-menti Dumás Élet	ERS22560517	Dog_gut_microbiome_DMD_E_PF1_24_0622_Citrom_N2	750	14.72	10	7360	22.6
Duna-menti Dumás	Duna-menti Dumás Élet	ERS22560518	Dog_gut_microbiome_DMD_E_PF1_24_0711_Citrom_N3	750	15.8	10	7900	31
Duna-menti Dumás	Duna-menti Dumás Élet	ERS22560519	Dog_gut_microbiome_DMD_E_PF1_24_0722_Citrom_N4	750	25.7	10	12850	32.4
Duna-menti Dumás	Duna-menti Dumás Édes	ERS22560520	Dog_gut_microbiome_DMD_E_PF2_24_0622_Lila_N2	750	59.6		2980	73.2
Duna-menti Dumás	Duna-menti Dumás Édes	ERS22560521	Dog_gut_microbiome_DMD_E_PF2_24_0624_Lila_N1	750	14.9	10	7450	31
Duna-menti Dumás	Duna-menti Dumás Édes	ERS22560522	Dog_gut_microbiome_DMD_E_PF2_24_0711_Lila_N3	750	14.6	10	7300	48.6
Duna-menti Dumás	Duna-menti Dumás Édes	ERS22560523	Dog_gut_microbiome_DMD_E_PF2_24_0722_Lila_N4	750	15.2	10	7600	36.8
Duna-menti Dumás	Duna-menti Dumás Elixir	ERS22560524	Dog_gut_microbiome_DMD_E_PF3_24_0617_Narancs_N1	750	45.3		2265	57.8
Duna-menti Dumás	Duna-menti Dumás Elixir	ERS22560525	Dog_gut_microbiome_DMD_E_PF3_24_0711_Narancs_N2	750	12.9	10	6450	50.8
Duna-menti Dumás	Duna-menti Dumás Elixir	ERS22560526	Dog_gut_microbiome_DMD_E_PF3_24_0722_Narancs_N3	750	14	10	7000	47.6
Duna-menti Dumás	Duna-menti Dumás Elit	ERS22560527	Dog_gut_microbiome_DMD_E_PF4_24_0616_Rozsaszin_N1	750	27		1350	49.2
Duna-menti Dumás	Duna-menti Dumás Elit	ERS22560528	Dog_gut_microbiome_DMD_E_PF4_24_0623_Rozsaszin_N2	750	118		5900	26.8
Duna-menti Dumás	Duna-menti Dumás Elit	ERS22560529	Dog_gut_microbiome_DMD_E_PF4_24_0711_Rozsaszin_N3	750	75.4		3770	25

Duna-menti Dumás	Duna-menti Dumás Elit	ERS22560530	Dog_gut_microbiome_DMD_E_PF4_240722_Rozsaszin_N4	750	103		5150	19.5
Pattogó Parázs	Cseri Subás Sári	ERS22560531	Dog_gut_microbiome_PP_0_AF1_230814_Sari1	750	13		650	53
Pattogó Parázs	Cseri Subás Sári	ERS22560532	Dog_gut_microbiome_PP_0_AF1_230714_Sari2	750	62.8		3140	25.8
Pattogó Parázs	Pattogó Parázs Cecilia	ERS22560533	Dog_gut_microbiome_PP_0_AF2_230714_Cecilia1	750	37		1850	82
Pattogó Parázs	Pattogó Parázs Cecilia	ERS22560534	Dog_gut_microbiome_PP_0_AF2_230814_Cecilia2	750	57.2		2860	27.6
Pattogó Parázs	Sparkling Embers Fáncsi	ERS22560535	Dog_gut_microbiome_PP_0_AF3_230709_Fancsi2	750	108		5400	91.8
Pattogó Parázs	Sparkling Embers Göndör	ERS22560536	Dog_gut_microbiome_PP_0_AF4_230714_Gondor1	750	9.82		491	74.8
Pattogó Parázs	Sparkling Embers Göndör	ERS22560537	Dog_gut_microbiome_PP_0_AF4_230814_Gondor2	750	15.5		775	72.2
Pattogó Parázs	Pattogó Parázs Huncut	ERS22560538	Dog_gut_microbiome_PP_0_AF5_230714_Huncut1	750	24		1200	55
Pattogó Parázs	Pattogó Parázs Huncut	ERS22560539	Dog_gut_microbiome_PP_0_AF5_230814_Huncut2	750	20.2		1010	56.4
Pattogó Parázs	Pattogó Parázs Apóka	ERS22560540	Dog_gut_microbiome_PP_0_AM1_230714_Apo1	750	84		4200	58.6
Pattogó Parázs	Pattogó Parázs Apóka	ERS22560541	Dog_gut_microbiome_PP_0_AM1_230814_Apo2	750	58.2		2910	32
Pattogó Parázs	Sparkling Embers Felség	ERS22560542	Dog_gut_microbiome_PP_0_AM2_230714_Felseg1	750	71.4		3570	69
Pattogó Parázs	Sparkling Embers Felség	ERS22560543	Dog_gut_microbiome_PP_0_AM2_230814_Felseg2	750	114		5700	24.2
Pattogó Parázs	Sparkling Embers Guru	ERS22560544	Dog_gut_microbiome_PP_0_AM3_230714_Guru1	750	18.4		920	27.4
Pattogó Parázs	Sparkling Embers Guru	ERS22560545	Dog_gut_microbiome_PP_0_AM3_230814_Guru2	750	17.9		895	32.4
Pattogó Parázs	Pattogó Parázs Kiváncsi	ERS22560546	Dog_gut_microbiome_PP_K_PF1_230724_Piros2	750	65.8		3290	24
Pattogó Parázs	Pattogó Parázs Kiváncsi	ERS22560547	Dog_gut_microbiome_PP_K_PF1_230806_Piros1	750	88		4400	20.6
Pattogó Parázs	Pattogó Parázs Kiváncsi	ERS22560548	Dog_gut_microbiome_PP_K_PF1_230814_Piros3	750	72.4		3620	57.8
Pattogó Parázs	Pattogó Parázs Kiváncsi	ERS22560549	Dog_gut_microbiome_PP_K_PF1_230904_Piros4	750	93.4		4670	27.4
Pattogó Parázs	Pattogó Parázs Kócos	ERS22560550	Dog_gut_microbiome_PP_K_PF2_230806_Kocos1	750	42		2100	61.4

Pattogó Parázis	Pattogó Parázis Kócos	ERS22560551	Dog_gut_microbiome_PP_K_Pf2_230814_Kocos2	750	68.6		3430	51.6
Pattogó Parázis	Pattogó Parázis Kócos	ERS22560552	Dog_gut_microbiome_PP_K_Pf2_230904_Kocos3	750	36.6		1830	17.6
Pattogó Parázis	Pattogó Parázis Kócos	ERS22560553	Dog_gut_microbiome_PP_K_Pf2_230911_Kocos4	750	45		2250	30.6
Pattogó Parázis	Pattogó Parázis Kócos	ERS22560554	Dog_gut_microbiome_PP_K_Pf2_230918_Kocos5	750	37.8		1890	25.8
Pattogó Parázis	Pattogó Parázis Karma	ERS22560555	Dog_gut_microbiome_PP_K_Pm1_230722_Bezs5	750	84.4		4220	4.26
Pattogó Parázis	Pattogó Parázis Karma	ERS22560556	Dog_gut_microbiome_PP_K_Pm1_230726_Bezs1	750	29.4		1470	31.4
Pattogó Parázis	Pattogó Parázis Karma	ERS22560557	Dog_gut_microbiome_PP_K_Pm1_230726_Bezs4	750	81.2		4060	35
Pattogó Parázis	Pattogó Parázis Karma	ERS22560558	Dog_gut_microbiome_PP_K_Pm1_230806_Bezs2	750	18.3		915	34.8
Pattogó Parázis	Pattogó Parázis Karma	ERS22560559	Dog_gut_microbiome_PP_K_Pm1_230814_Bezs3	750	77.2		3860	51.2
Pattogó Parázis	Pattogó Parázis Korom	ERS22560560	Dog_gut_microbiome_PP_K_Pm2_230726_Kek1	750	21.8		1090	31.2
Pattogó Parázis	Pattogó Parázis Korom	ERS22560561	Dog_gut_microbiome_PP_K_Pm2_230806_Kek2	750	56.6		2830	28.2
Pattogó Parázis	Pattogó Parázis Korom	ERS22560562	Dog_gut_microbiome_PP_K_Pm2_230814_Kek3	750	55		2750	34
Pattogó Parázis	Pattogó Parázis Korom	ERS22560563	Dog_gut_microbiome_PP_K_Pm2_230820_Kek4	750	66		3300	30.6
Pattogó Parázis	Pattogó Parázis Kuruc	ERS22560564	Dog_gut_microbiome_PP_K_Pm3_230727_Lila1	750	99.8		4990	27.8
Pattogó Parázis	Pattogó Parázis Kuruc	ERS22560565	Dog_gut_microbiome_PP_K_Pm3_230806_Lila2	750	67.4		3370	30.4
Pattogó Parázis	Pattogó Parázis Kuruc	ERS22560566	Dog_gut_microbiome_PP_K_Pm3_230903_Lila3	750	10.9		545	14.1
Pattogó Parázis	Pattogó Parázis Ködmön	ERS22560567	Dog_gut_microbiome_PP_K_Pm4_230806_Zold3	750	84.2		4210	17.5
Pattogó Parázis	Pattogó Parázis Ködmön	ERS22560568	Dog_gut_microbiome_PP_K_Pm4_230814_Zold4	750	57.6		2880	29.8
Pattogó Parázis	Pattogó Parázis Ködmön	ERS22560569	Dog_gut_microbiome_PP_K_Pm4_230904_Zold5	750	104		5200	13.3
Pattogó Parázis	Pattogó Parázis Ködmön	ERS22560570	Dog_gut_microbiome_PP_K_Pm4_230911_Zold1	750	49.2		2460	15.6
Pattogó Parázis	Pattogó Parázis Ködmön	ERS22560571	Dog_gut_microbiome_PP_K_Pm4_230918_Zold2	750	18		900	33.8

Pattogó Parázs	Pattogó Parázs Kobold	ERS22560572	Dog_gut_microbiome_PP_K_PM5_230814_Kobold1	750	29.1	5	7275	24.6
Pattogó Parázs	Pattogó Parázs Kobold	ERS22560573	Dog_gut_microbiome_PP_K_PM5_230820_Kobold2	750	64.4		3220	12.4
Pattogó Parázs	Pattogó Parázs Kobold	ERS22560574	Dog_gut_microbiome_PP_K_PM5_230904_Kobold3	750	47.4		2370	9.56
Pattogó Parázs	Pattogó Parázs Kobold	ERS22560575	Dog_gut_microbiome_PP_K_PM5_230911_Kobold4	750	46		2300	19.5
Pattogó Parázs	Pattogó Parázs Kobold	ERS22560576	Dog_gut_microbiome_PP_K_PM5_230918_Kobold5	750	55.8		2790	23.2

12.4. Supplementary Data 4

Supplementary Data 4: Details of the libraries pooled per flow cell and sequencing read statistics (after Dorado basecalling) for each library. In total, 463 libraries were sequenced across 25 flow cells. As seven samples were excluded from the present analysis for study-design reasons (see Supplementary Data 2) the following data lists only the 456 libraries included in the analyses.

sequencing flow-cell-(ONT-R9) ID	ENA sample accession number	barcode sequence	target 16S amplicon size	per library in sequencing pooling (fmol)	reads count	length(bp) [mean]	quality score [mean]
FAY71907	ERS22560181	AAGAAAGTTGTCGGTGCTTTTGTC	~1500 bp	4.17	148851	1528.827324	21.55386615
FAY71907	ERS22560182	TCGATTCCGTTTGTAGTCGCTCTGT	~1500 bp	4.17	199007	1524.434638	21.63573839
FAY71907	ERS22560183	GAGTCTTGTCGTC CCAGTACCAGG	~1500 bp	4.17	117733	1495.842542	21.48297223
FAY71907	ERS22560184	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.17	146345	1501.526742	21.54588472
FAY71907	ERS22560185	CTTGTCAGGGTTTGTAACCTT	~1500 bp	4.17	189775	1543.591859	21.49000263
FAY71907	ERS22560186	TTCTCGCAAAGGCAGAAAGTAGTC	~1500 bp	4.17	186920	1530.696485	21.46063428
FAY71907	ERS22560187	GTGTTACCGTGGGAATGAATCCTT	~1500 bp	4.17	136408	1495.227003	21.44470339
FAY71907	ERS22560158	AACTAGGCACAGCGAGTCTTGTT	~1500 bp	4.17	156537	1546.324722	21.54054466
FAY71907	ERS22560159	AAGCGTTGAAACCTTGTCCCTCTC	~1500 bp	4.17	148578	1554.968979	21.64147444
FAY71907	ERS22560160	GTTTCATCTATCGGAGGGAATGGA	~1500 bp	4.17	140928	1519.23187	21.56308746
FAY71907	ERS22560161	CAGGTAGAAAGAGCAGAATCCGGA	~1500 bp	4.17	144098	1533.686019	21.46812995
FAY71907	ERS22560162	AGAACGACTTCCATACTCGTGTA	~1500 bp	4.17	151939	1545.911616	21.5473053
FAY71907	ERS22560163	AACGAGTCTCTTGGGACCCATAGA	~1500 bp	4.17	173505	1524.946157	21.57183142
FAY71907	ERS22560164	AGGTCTACCTCGCTAACACCACTG	~1500 bp	4.17	147511	1534.228024	21.47519893
FAY71907	ERS22560115	CGTCAACTGACAGTGGTTCCGTA	~1500 bp	4.17	185412	1535.008376	21.61793174
FAY71907	ERS22560116	ACCCTCCAGGAAAGTACCTCTGAT	~1500 bp	4.17	133701	1511.28646	21.38791131

FAY71907	ERS22560117	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	144468	1524.742123	21.57886792
FAY71907	ERS22560118	GTCCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	163323	1529.441597	21.57682249
FAY71907	ERS22560119	TTGCGTCCTGTTA CGAGAACTCAT	~1500 bp	4.17	144407	1547.735324	21.69948195
FAY71907	ERS22560120	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	140369	1500.77874	21.76760667
FAY71907	ERS22560121	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	141560	1535.561889	21.50705673
FAY71907	ERS22560124	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	175743	1531.744593	21.5176481
FAY71907	ERS22560125	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	160873	1529.342773	21.55655741
FAY75144	ERS22560126	AAGAAAGTTGTC GGTGCTTTGTG	~1500 bp	4.17	243356	1544.846238	21.43840415
FAY75144	ERS22560127	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	266127	1546.644688	21.5444407
FAY75144	ERS22560128	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	248058	1522.090007	21.41165292
FAY75144	ERS22560129	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.17	225340	1532.687552	21.600691
FAY75144	ERS22560130	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.17	232758	1548.0294	21.40221573
FAY75144	ERS22560174	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	228306	1545.740458	21.35259038
FAY75144	ERS22560175	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	276057	1554.981765	21.40503077
FAY75144	ERS22560176	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	272834	1545.891949	21.4121939
FAY75144	ERS22560177	AACTAGGCACAG CGAGTCTTGTTG	~1500 bp	4.17	301447	1535.856496	21.41454299
FAY75144	ERS22560143	AAGCGTTGAAAC CTTTGTCCTCTC	~1500 bp	4.17	269209	1532.600311	21.41662846
FAY75144	ERS22560144	GTTTCACTATCG GAGGGAATGGA	~1500 bp	4.17	287336	1520.204604	21.45579701
FAY75144	ERS22560145	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	257383	1495.498129	21.38706395
FAY75144	ERS22560146	AGAACGACTTCC ATACTCGTGTA	~1500 bp	4.17	279550	1505.620994	21.46654945
FAY75144	ERS22560147	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	313407	1520.802908	21.49696079
FAY75144	ERS22560148	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	320597	1542.388129	21.44411379
FAY75144	ERS22560149	CGTCAACTGACA GTGGTTCTGACT	~1500 bp	4.17	256682	1546.782186	21.52241396
FAY75144	ERS22560178	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	281005	1538.55315	21.27410665
FAY75144	ERS22560191	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	314878	1516.694256	21.36424787
FAY75144	ERS22560192	GTCCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	247492	1548.306511	21.43057699
FAY75144	ERS22560150	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	504714	1510.435227	21.52277161
FAY75144	ERS22560151	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	233067	1532.124458	21.45029065
FAY75144	ERS22560152	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	285037	1528.656785	21.29410413
FAY75144	ERS22560153	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	269782	1522.611093	21.35833566
FAW15696	ERS22560154	AAGAAAGTTGTC GGTGCTTTGTG	~1500 bp	5.26	169598	1491.148115	20.25160291
FAW15696	ERS22560155	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	5.26	167512	1507.406825	20.35143715
FAW15696	ERS22560166	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	5.26	172940	1531.965971	20.28364421
FAW15696	ERS22560167	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	5.26	176493	1506.827432	20.44013281
FAW15696	ERS22560168	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	5.26	173998	1558.864228	20.33238652

FAW15696	ERS22560169	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	5.26	158014	1542.005696	20.31822744
FAW15696	ERS22560170	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	5.26	195149	1555.729063	20.36856433
FAW15696	ERS22560171	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	5.26	213209	1552.34189	20.32811551
FAW15696	ERS22560172	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	5.26	156384	1550.645667	20.32490728
FAW15696	ERS22560194	AAGCGTTGAAAC CTTGTCTCTC	~1500 bp	5.26	166694	1540.230446	20.35013468
FAW15696	ERS22560195	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	5.26	176469	1446.985867	20.18987182
FAW15696	ERS22560190	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	5.26	173747	1481.075455	20.1620893
FAW15696	ERS22560134	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	5.26	193854	1499.702606	20.35271968
FAW15696	ERS22560135	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	5.26	148849	1516.752514	20.38095956
FAW15696	ERS22560136	AGGTCTACCTCG CTAACACCACTG	~1500 bp	5.26	204177	1532.754419	20.23950347
FAW15696	ERS22560137	CGTCAACTGACA GTGGTTCGTACT	~1500 bp	5.26	189740	1544.580552	20.38751681
FAW15696	ERS22560138	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	5.26	174767	1521.329233	20.15660645
FAW15696	ERS22560139	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	5.26	205950	1512.587317	20.21497252
FAW15696	ERS22560140	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	5.26	181395	1517.424323	20.27845988
FAY75189	ERS22560141	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.35	256481	1532.377919	20.0369386
FAY75189	ERS22560165	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.35	274709	1538.01989	20.10241044
FAY75189	ERS22560122	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.35	276392	1531.070816	20.08771585
FAY75189	ERS22560123	TTCGGATTCTATC GTGTTTCCCTA	~1500 bp	4.35	319764	1527.366958	20.14639028
FAY75189	ERS22560131	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.35	312627	1544.948149	20.01479565
FAY75189	ERS22560132	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.35	408546	1539.730226	19.99519484
FAY75189	ERS22560156	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.35	481400	1554.827725	20.0747279
FAY75189	ERS22560173	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.35	382928	1528.838236	20.15788699
FAY75189	ERS22560189	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.35	692060	1540.680989	20.05016286
FAY75189	ERS22560157	AAGCGTTGAAAC CTTGTCTCTC	~1500 bp	4.35	642057	1539.08137	20.01538483
FAY75189	ERS22560179	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.35	490824	1531.60767	20.00331119
FAY75189	ERS22560188	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	4.35	366828	1521.978554	19.99590735
FAY75189	ERS22560133	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.35	425608	1516.743233	20.03198918
FAY75189	ERS22560193	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.35	451767	1527.929165	19.96338982
FAY75189	ERS22560142	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.35	427714	1539.31071	19.98586593
FAY75189	ERS22560490	CGTCAACTGACA GTGGTTCGTACT	~1500 bp	4.35	404935	1538.116421	20.0824844
FAY75189	ERS22560492	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.35	369791	1545.537901	20.02910842
FAY75189	ERS22560459	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.35	498822	1537.183192	20.08574145
FAY75189	ERS22560441	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.35	432917	1548.177242	20.06746947
FAY75189	ERS22560442	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.35	471173	1538.453916	20.12540532
FAY75189	ERS22560420	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.35	347378	1545.446591	20.03425951
FAY75189	ERS22560481	CTTACTACCCAG TGAACCTCTCTG	~1500 bp	4.35	326530	1532.257823	19.95291165

FAY71759	ERS22560203	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	235395	1463.974226	21.03053633
FAY71759	ERS22560199	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	268158	1533.754205	21.17426968
FAY71759	ERS22560200	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	198864	1424.987212	20.9811446
FAY71759	ERS22560201	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.17	235383	1491.444013	21.11760446
FAY71759	ERS22560198	CTTGTCAGGGT TTGTGTAACCTT	~1500 bp	4.17	255587	1538.072367	21.08178166
FAY71759	ERS22560196	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	270395	1509.785573	21.03604175
FAY71759	ERS22560197	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	303951	1528.090515	21.10841688
FAY71759	ERS22560202	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	235504	1540.044539	21.09056946
FAY71759	ERS22560231	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	276822	1536.055696	21.09645935
FAY71759	ERS22560232	AAGCGTTGAAAC CTTGTCTCTC	~1500 bp	4.17	281922	1538.275839	21.08364821
FAY71759	ERS22560233	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	301464	1538.631681	21.13539298
FAY71759	ERS22560230	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	286398	1520.123936	20.98914958
FAY71759	ERS22560228	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	263945	1541.918506	21.11845513
FAY71759	ERS22560227	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	142922	1405.181777	20.99748695
FAY71759	ERS22560229	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	254001	1552.677887	21.06325542
FAY71759	ERS22560210	CGTCAACTGACA GTGGTTCGTACT	~1500 bp	4.17	265310	1536.529249	21.12518616
FAY71759	ERS22560211	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	270612	1567.073496	21.02731291
FAY71759	ERS22560214	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	290904	1493.205205	20.99260034
FAY71759	ERS22560215	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	270112	1545.818653	21.13761603
FAY71759	ERS22560213	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	251987	1532.077861	21.09528436
FAY71759	ERS22560212	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	290390	1549.732759	21.24271342
FAY71759	ERS22560216	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	301118	1540.6315	21.06928208
FAY71759	ERS22560219	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	287532	1527.376995	21.06450357
FAY75237	ERS22560220	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.35	252989	1338.21812	21.67553317
FAY75237	ERS22560222	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.35	201218	1388.260966	21.81434732
FAY75237	ERS22560221	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.35	213454	1369.859618	21.78334484
FAY75237	ERS22560217	CTTGTCAGGGT TTGTGTAACCTT	~1500 bp	4.35	279034	1394.221303	21.72990213
FAY75237	ERS22560218	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.35	272976	1400.417256	21.82853973
FAY75237	ERS22560223	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.35	200476	1389.873521	21.76610093
FAY75237	ERS22560226	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.35	284773	1413.64163	21.710172
FAY75237	ERS22560209	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.35	220458	1369.179014	21.78953792
FAY75237	ERS22560205	AAGCGTTGAAAC CTTGTCTCTC	~1500 bp	4.35	291915	1407.457643	21.75432153
FAY75237	ERS22560208	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.35	284641	1350.610934	21.70473006
FAY75237	ERS22560204	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.35	246932	1396.64996	21.67067176
FAY75237	ERS22560206	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.35	249283	1410.022304	21.81098346

FAY75237	ERS22560207	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.35	261189	1382.431462	21.6967275
FAY75237	ERS22560224	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.35	237897	1417.558158	21.79971282
FAY75237	ERS22560225	CGTCAACTGACA GTGGTTCCGTA	~1500 bp	4.35	229075	1413.29403	21.81731145
FAY75237	ERS22560234	GTTCTCTGTGCA GTGTCAAGAGAT	~1500 bp	4.35	215018	1400.320675	21.97624445
FAY75237	ERS22560238	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.35	256848	1405.447183	21.82069352
FAY75237	ERS22560240	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.35	288373	1392.506105	21.82653705
FAY75237	ERS22560239	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.35	265022	1394.343692	21.71952898
FAY75237	ERS22560236	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.35	243391	1390.919151	21.76032873
FAY75237	ERS22560237	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.35	243553	1410.093261	21.83528994
FAY75237	ERS22560235	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.35	289306	1403.768415	21.68661403
FAQ80377	ERS22560241	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	118679	1532.993984	18.78447366
FAQ80377	ERS22560242	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	108897	1546.522117	18.89594709
FAQ80377	ERS22560243	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	116883	1542.345414	18.80144384
FAQ80377	ERS22560244	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	4.17	113971	1534.728036	18.81554273
FAQ80377	ERS22560245	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.17	112646	1560.550184	18.87037418
FAQ80377	ERS22560246	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	119330	1541.941272	18.76646275
FAQ80377	ERS22560247	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	123099	1536.761403	18.80541255
FAQ80377	ERS22560248	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	137971	1535.293931	18.76455625
FAQ80377	ERS22560249	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	103679	1554.734199	18.84818584
FAQ80377	ERS22560250	AAGCGTTGAAAC CTTGTCCCTCTC	~1500 bp	4.17	232659	1542.110806	18.79804933
FAQ80377	ERS22560496	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	123859	1532.338934	18.84942087
FAQ80377	ERS22560471	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	143590	1545.198809	18.80462121
FAQ80377	ERS22560472	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	115794	1547.44308	18.79288702
FAQ80377	ERS22560468	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	109106	1538.62453	18.81712298
FAQ80377	ERS22560469	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	106326	1544.138583	18.77616171
FAQ80377	ERS22560480	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	119040	1529.294792	18.66348034
FAQ80377	ERS22560482	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	108933	1521.752821	18.74954256
FAQ80377	ERS22560451	GTTCTCTGTGCA GTGTCAAGAGAT	~1500 bp	4.17	89279	1546.434156	18.82459649
FAQ80377	ERS22560433	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	97033	1554.140602	18.90254398
FAQ80377	ERS22560516	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	112461	1532.226087	18.85102836
FAQ80377	ERS22560512	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	97813	1515.656999	18.7966849
FAQ80377	ERS22560524	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	99752	1534.362188	18.7747982
FAQ80377	ERS22560527	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	92596	1538.06834	18.86438637
FAW15715	ERS22560281	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	188582	1497.223452	18.88075405
FAW15715	ERS22560278	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	211119	1498.763205	18.95148878

FAW15715	ERS22560279	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	283687	1526.664729	18.91963467
FAW15715	ERS22560275	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	4.17	260045	1518.218612	18.95225546
FAW15715	ERS22560282	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.17	319802	1549.972927	18.99577148
FAW15715	ERS22560284	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	241100	1514.419067	18.89519117
FAW15715	ERS22560277	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	366039	1535.295132	18.97851131
FAW15715	ERS22560276	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	179371	1539.887011	18.97937381
FAW15715	ERS22560287	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	293080	1530.34625	18.87323089
FAW15715	ERS22560283	AAGCGTTGAAAC CTTTGTCCTCTC	~1500 bp	4.17	275421	1539.812353	18.91055432
FAW15715	ERS22560285	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	221640	1516.505369	18.89083239
FAW15715	ERS22560286	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	309533	1504.338358	18.93028336
FAW15715	ERS22560280	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	257273	1520.170787	18.84791805
FAW15715	ERS22560288	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	249710	1524.614857	18.93612014
FAW15715	ERS22560289	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	340541	1543.100373	18.86832957
FAW15715	ERS22560293	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.17	350217	1526.131147	18.94666521
FAW15715	ERS22560290	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	263843	1539.988721	18.80442047
FAW15715	ERS22560296	CCAAACCAACA ACCTAGATAGGC	~1500 bp	4.17	326541	1512.032602	18.82509033
FAW15715	ERS22560291	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	281716	1540.047814	19.04057469
FAW15715	ERS22560292	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	125306	1545.285733	18.9575725
FAW15715	ERS22560298	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	121142	1496.345512	19.0029458
FAW15715	ERS22560300	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	173582	1457.429883	18.75844454
FAW15715	ERS22560299	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	192956	1476.474595	18.75980648
FAW15715	ERS22560301	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	108237	1447.613044	18.78456332
FAW15725	ERS22560302	AAGAAAGTTGTC GGTGCTTTGTG	~1500 bp	4.17	185485	1475.523724	19.24697862
FAW15725	ERS22560294	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	118433	1359.169522	19.16535628
FAW15725	ERS22560295	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	123600	1438.986626	19.18347395
FAW15725	ERS22560297	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	4.17	137822	1460.286166	19.32783656
FAW15725	ERS22560262	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.17	194011	1508.281479	19.35986305
FAW15725	ERS22560266	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	223607	1402.712223	19.04744494
FAW15725	ERS22560260	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	156941	1460.796439	19.27169478
FAW15725	ERS22560264	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	184198	1491.955993	19.32052433
FAW15725	ERS22560261	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	212095	1540.921427	19.43891964
FAW15725	ERS22560269	AAGCGTTGAAAC CTTTGTCCTCTC	~1500 bp	4.17	259986	1464.926073	19.22364454
FAW15725	ERS22560268	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	207211	1502.458079	19.28465941
FAW15725	ERS22560271	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	142126	1462.214092	19.21148917
FAW15725	ERS22560270	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	267621	1467.812885	19.35815228
FAW15725	ERS22560265	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	271120	1491.402914	19.30548661

FAW15725	ERS22560273	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	209274	1543.990864	19.45711952
FAW15725	ERS22560274	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.17	164568	1421.897562	19.27493085
FAW15725	ERS22560272	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	285769	1521.731111	19.23470583
FAW15725	ERS22560263	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	213828	1527.966221	19.41367632
FAW15725	ERS22560267	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	110618	1498.207163	19.32281708
FAW15725	ERS22560387	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	137318	1547.064376	19.42268778
FAW15725	ERS22560385	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	179167	1528.165148	19.50002512
FAW15725	ERS22560388	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	191311	1539.018143	19.38347957
FAW15725	ERS22560389	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	262110	1499.407371	19.31050494
FAW15725	ERS22560391	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	226044	1542.661331	19.46153395
FAW14826	ERS22560390	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.76	266714	1543.279408	19.24594056
FAW14826	ERS22560392	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.76	237069	1549.389473	19.36764499
FAW14826	ERS22560386	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.76	287791	1545.124788	19.21581273
FAW14826	ERS22560251	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	4.76	329707	1543.79564	19.23102464
FAW14826	ERS22560252	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.76	292606	1540.372159	19.15679275
FAW14826	ERS22560253	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.76	306832	1545.978262	19.30733408
FAW14826	ERS22560254	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.76	316264	1542.218893	19.18864948
FAW14826	ERS22560258	AACTAGGCACAG CGAGTCTTGTTT	~1500 bp	4.76	297947	1548.574475	19.23512756
FAW14826	ERS22560259	AAGCGTTGAAAC CTTGTCTCTCTC	~1500 bp	4.76	63799	1549.902303	19.25069907
FAW14826	ERS22560257	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.76	319209	1548.998684	19.25731057
FAW14826	ERS22560255	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.76	291163	1541.174895	19.14909123
FAW14826	ERS22560303	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.76	312255	1548.718954	19.21099079
FAW14826	ERS22560304	AACGAGTCTCTT GGGACCATAGA	~1500 bp	4.76	301500	1542.290242	19.19770106
FAW14826	ERS22560305	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.76	342414	1545.740162	19.29571898
FAW14826	ERS22560306	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.76	392392	1541.295832	19.35206541
FAW14826	ERS22560309	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.76	298134	1549.19397	19.14721535
FAW14826	ERS22560307	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.76	355714	1547.17985	19.25996784
FAW14826	ERS22560308	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.76	323721	1555.608654	19.34729931
FAW14826	ERS22560310	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.76	386419	1562.932384	19.50379474
FAW14826	ERS22560311	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.76	344467	1559.793304	19.51437203
FAY75112	ERS22560313	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	219560	1524.059788	19.66517052
FAY75112	ERS22560314	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	424998	1512.710003	19.70506697
FAY75112	ERS22560337	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	531676	1518.273033	19.60090266
FAY75112	ERS22560341	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	4.17	383585	1515.14736	19.69196186
FAY75112	ERS22560374	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.17	262972	1540.095322	19.60515196

FAY75112	ERS22560323	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	353093	1529.815592	19.61014971
FAY75112	ERS22560324	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	269553	1528.466992	19.59670963
FAY75112	ERS22560330	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	741950	1529.004468	19.61935236
FAY75112	ERS22560331	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	483063	1537.271294	19.69061255
FAY75112	ERS22560345	AAGCGTTGAAAC CTTGTCTCTC	~1500 bp	4.17	489300	1526.392504	19.6413241
FAY75112	ERS22560346	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	513499	1484.788927	19.60561725
FAY75112	ERS22560348	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	4.17	344430	1493.853218	19.5405395
FAY75112	ERS22560335	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	536457	1515.010517	19.5770123
FAY75112	ERS22560344	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	468455	1524.46293	19.63999853
FAY75112	ERS22560336	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	522958	1530.82438	19.57038888
FAY75112	ERS22560325	CGTCAACTGACA GTGGTTCGTACT	~1500 bp	4.17	493515	1536.655903	19.67874458
FAY75112	ERS22560347	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	479472	1502.479279	19.46801373
FAY75112	ERS22560328	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	401644	1522.339908	19.59866633
FAY75112	ERS22560329	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	417204	1512.430741	19.59777819
FAY75112	ERS22560316	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	437196	1527.918652	19.61599704
FAY75112	ERS22560312	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	479367	1503.245561	19.73047696
FAY75112	ERS22560317	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	480432	1514.482025	19.59254356
FAY75112	ERS22560339	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	486023	1527.79238	19.56062863
FAY75112	ERS22560326	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	501714	1510.804399	19.63445672
FAY75183	ERS22560327	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	234928	1519.365874	21.7731734
FAY75183	ERS22560350	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	291142	1539.213927	21.87190251
FAY75183	ERS22560397	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	355767	1533.79493	21.69233049
FAY75183	ERS22560371	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.17	486553	1529.13603	21.8228288
FAY75183	ERS22560338	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.17	449976	1559.43349	21.75797591
FAY75183	ERS22560342	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	407667	1555.116419	21.75901358
FAY75183	ERS22560343	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	304362	1560.075183	21.88670695
FAY75183	ERS22560372	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	330703	1555.763407	21.79586941
FAY75183	ERS22560373	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	292125	1556.871928	21.80738667
FAY75183	ERS22560379	AAGCGTTGAAAC CTTGTCTCTC	~1500 bp	4.17	312870	1550.191776	21.79624231
FAY75183	ERS22560358	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	336510	1545.819869	21.8210534
FAY75183	ERS22560384	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	4.17	351655	1546.352337	21.75484318
FAY75183	ERS22560340	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	399255	1545.800824	21.77513524
FAY75183	ERS22560332	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	332834	1548.341329	21.83590069
FAY75183	ERS22560333	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	292275	1549.726227	21.7423559
FAY75183	ERS22560349	CGTCAACTGACA GTGGTTCGTACT	~1500 bp	4.17	552242	1555.429024	21.8868751
FAY75183	ERS22560351	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	377492	1561.85956	21.69980813

FAW75183	ERS22560352	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	496739	1561.510538	21.85183485
FAW75183	ERS22560356	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	388850	1547.387921	21.8371885
FAW75183	ERS22560357	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	352075	1551.413767	21.83430891
FAW75183	ERS22560315	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	520899	1550.414835	21.8893517
FAW75183	ERS22560318	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	348177	1555.393613	21.75027618
FAW75183	ERS22560319	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	556366	1558.611058	21.74786125
FAW75183	ERS22560366	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	805217	1553.683195	21.79764688
FAW16400	ERS22560321	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	201208	1563.62586	20.70187776
FAW16400	ERS22560408	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	206507	1571.496206	20.75644816
FAW16400	ERS22560409	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	220349	1568.396893	20.71606433
FAW16400	ERS22560361	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.17	219810	1549.562345	20.72244434
FAW16400	ERS22560334	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.17	208232	1561.562262	20.61930573
FAW16400	ERS22560406	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	227797	1567.601193	20.68299165
FAW16400	ERS22560404	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	198179	1571.279944	20.86860747
FAW16400	ERS22560368	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	196980	1571.463727	20.70674475
FAW16400	ERS22560413	AAGCGTTGAAAC CTTGTCCCTCTC	~1500 bp	4.17	216334	1576.664662	20.74507965
FAW16400	ERS22560375	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	202225	1569.270239	20.6185081
FAW16400	ERS22560376	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	4.17	287146	1559.060701	20.63961114
FAW16400	ERS22560320	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	206063	1558.610323	20.62731019
FAW16400	ERS22560407	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	212556	1559.090362	20.5876425
FAW16400	ERS22560359	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	221131	1545.750175	20.54877127
FAW16400	ERS22560412	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.17	204207	1570.774322	20.68164333
FAW16400	ERS22560402	ACCCTCCAGGAA AGTACCTTGAT	~1500 bp	4.17	194216	1568.778211	20.75819129
FAW16400	ERS22560399	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	210797	1556.42827	20.61252361
FAW16400	ERS22560400	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	223469	1568.479516	20.67692951
FAW16400	ERS22560414	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	188497	1565.409985	20.69059439
FAW16400	ERS22560403	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	213508	1566.618005	20.74373255
FAW16400	ERS22560405	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	213448	1563.820771	20.67412143
FAW13142	ERS22560411	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.35	298170	1519.264031	20.79229208
FAW13142	ERS22560398	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.35	255677	1553.965726	20.83355988
FAW13142	ERS22560364	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.35	308841	1563.46895	20.66139965
FAW13142	ERS22560353	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.35	326774	1563.010313	20.71447037
FAW13142	ERS22560370	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	4.35	318389	1570.336503	20.69671415
FAW13142	ERS22560365	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.35	328159	1567.130114	20.67450541
FAW13142	ERS22560355	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.35	271141	1573.766325	20.95140846

FAW13142	ERS22560354	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.35	299797	1565.088913	20.67292288
FAW13142	ERS22560395	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.35	286661	1568.910012	20.6669338
FAW13142	ERS22560363	AAGCGTTGAAAC CTTGTCCCTCTC	~1500 bp	4.35	311713	1586.850285	20.88913228
FAW13142	ERS22560377	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.35	315935	1554.51615	20.63727286
FAW13142	ERS22560394	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	4.35	301839	1557.120564	20.60500625
FAW13142	ERS22560383	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.35	303987	1566.879222	20.77954991
FAW13142	ERS22560393	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.35	329697	1557.997504	20.67599086
FAW13142	ERS22560369	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.35	354587	1557.879821	20.65356229
FAW13142	ERS22560396	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.35	304351	1570.323731	20.72884232
FAW13142	ERS22560378	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.35	324561	1568.827	20.57832944
FAW13142	ERS22560382	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.35	315819	1568.20405	20.70974093
FAW13142	ERS22560401	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.35	292268	1556.079304	20.77785317
FAW13142	ERS22560322	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.35	286422	1562.320084	20.76387359
FAW13142	ERS22560381	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.35	295815	1566.56538	20.71543421
FAW13142	ERS22560380	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.35	295254	1560.130427	20.70484542
FAW13142	ERS22560410	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.35	281563	1570.122477	20.71179729
FAW16378	ERS22560446	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.35	170985	1516.30684	20.50853642
FAW16378	ERS22560447	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.35	183468	1490.108924	20.54773759
FAW16378	ERS22560445	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.35	232138	1519.218771	20.43672983
FAW16378	ERS22560436	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.35	446774	1527.620526	20.5035911
FAW16378	ERS22560476	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.35	241410	1528.401077	20.52759273
FAW16378	ERS22560477	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.35	146858	1550.035476	20.63600669
FAW16378	ERS22560475	GAGTCTTGTGTC CCAGTTACCAAG	~1500 bp	4.35	205617	1544.90778	20.46576115
FAW16378	ERS22560486	TTCCGATTCTATC GTGTTCCCTA	~1500 bp	4.35	376570	1525.850652	20.54996612
FAW16378	ERS22560488	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.35	288493	1535.191055	20.44318434
FAW16378	ERS22560491	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.35	290115	1542.120759	20.55164131
FAW16378	ERS22560493	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.35	232982	1531.37399	20.42267042
FAW16378	ERS22560494	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.35	254294	1527.182356	20.50963149
FAW16378	ERS22560495	AAGCGTTGAAAC CTTGTCCCTCTC	~1500 bp	4.35	245648	1551.054195	20.58265567
FAW16378	ERS22560483	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.35	258688	1503.215974	20.44980904
FAW16378	ERS22560484	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	4.35	244835	1511.783258	20.41258954
FAW16378	ERS22560497	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.35	264954	1506.032526	20.38315915
FAW16378	ERS22560508	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.35	251101	1497.416119	20.37731789
FAW16378	ERS22560505	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.35	282713	1523.117016	20.48094683
FAW16378	ERS22560507	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.35	261550	1536.205502	20.4735784
FAW16378	ERS22560506	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.35	289049	1529.58689	20.30181184

FAW16378	ERS22560498	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.35	291411	1516.050592	20.43799616
FAW15684	ERS22560444	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	191673	1546.990578	20.43832992
FAW15684	ERS22560443	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	258585	1554.662057	20.51986426
FAW15684	ERS22560426	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	159942	1494.848439	20.3660335
FAW15684	ERS22560427	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	4.17	197442	1510.852671	20.41694356
FAW15684	ERS22560429	CTTGTCAGGGT TTGTGTAACCTT	~1500 bp	4.17	240712	1560.894766	20.44956803
FAW15684	ERS22560425	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	237016	1534.088543	20.40806633
FAW15684	ERS22560428	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	277778	1535.447494	20.42731919
FAW15684	ERS22560419	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	243766	1526.908888	20.46785097
FAW15684	ERS22560422	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	193247	1551.193235	20.42716125
FAW15684	ERS22560423	AAGCGTTGAAAC CTTTGTCCTCTC	~1500 bp	4.17	300325	1558.98184	20.44690655
FAW15684	ERS22560424	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	213922	1519.023803	20.4261364
FAW15684	ERS22560421	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	384238	1495.768581	20.2835098
FAW15684	ERS22560464	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	239248	1508.266021	20.34800755
FAW15684	ERS22560466	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	211359	1488.403162	20.32074418
FAW15684	ERS22560467	AGGTCTACCTCG CTAACACCACGT	~1500 bp	4.17	266105	1539.355724	20.33326461
FAW15684	ERS22560465	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.17	327282	1531.135938	20.47681461
FAW15684	ERS22560454	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	291297	1537.204341	20.29142404
FAW15684	ERS22560458	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	228921	1551.967482	20.42759236
FAW15684	ERS22560462	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	211377	1514.863523	20.37976294
FAW15684	ERS22560460	TTGCGTCTGTTA CGAGAACTCAT	~1500 bp	4.17	516341	1542.739056	20.45488673
FAW15684	ERS22560461	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	238600	1538.195746	20.45583089
FAW15684	ERS22560463	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	258620	1542.629367	20.38702614
FAW15684	ERS22560478	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	321691	1525.783398	20.36539978
FAW15684	ERS22560479	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	233512	1531.665662	20.43577748
FAY75182	ERS22560449	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	4.17	327206	1546.117782	21.40563104
FAY75182	ERS22560450	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	330920	1545.095062	21.45367497
FAY75182	ERS22560431	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	311050	1556.024629	21.43367369
FAY75182	ERS22560432	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	4.17	335792	1558.267818	21.43864794
FAY75182	ERS22560485	CTTGTCAGGGT TTGTGTAACCTT	~1500 bp	4.17	326207	1558.922607	21.39314533
FAY75182	ERS22560455	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	351793	1544.718317	21.33611425
FAY75182	ERS22560437	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	343426	1549.419776	21.39226072
FAY75182	ERS22560438	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	372188	1545.90698	21.4484136
FAY75182	ERS22560416	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	4.17	329599	1546.79813	21.4259847
FAY75182	ERS22560456	AAGCGTTGAAAC CTTTGTCCTCTC	~1500 bp	4.17	1675951	1547.12987	21.39925204

FAY75182	ERS22560417	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	333209	1531.701935	21.35724257
FAY75182	ERS22560418	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	335688	1521.584644	21.45419086
FAY75182	ERS22560430	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	357508	1565.603119	21.45236702
FAY75182	ERS22560448	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	361463	1569.568592	21.50959235
FAY75182	ERS22560434	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	323877	1563.865239	21.43995486
FAY75182	ERS22560473	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.17	372973	1555.252587	21.46815107
FAY75182	ERS22560517	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	266010	1563.717879	21.3381259
FAY75182	ERS22560509	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	335393	1559.406759	21.46404892
FAY75182	ERS22560510	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	293534	1560.975454	21.46605702
FAY75182	ERS22560511	TTGCGTCCTGTTA CGAGAACTCAT	~1500 bp	4.17	287473	1547.654594	21.43048843
FAY75182	ERS22560521	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	309655	1561.568791	21.4791487
FAY75182	ERS22560503	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	330127	1563.822786	21.46488863
FAY75182	ERS22560504	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	312254	1558.526338	21.45393801
FAY75182	ERS22560513	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	323295	1558.529136	21.46779672
FAX03132	ERS22560439	AAGAAAGTTGTC GGTGCTTTGTG	~1500 bp	4.17	279154	1544.52797	20.79249361
FAX03132	ERS22560452	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	4.17	349585	1547.178532	20.72034635
FAX03132	ERS22560415	GAGTCTTGTGTC CCAGTTACCAGG	~1500 bp	4.17	398686	1547.927228	20.64901183
FAX03132	ERS22560457	TTCCGATTCTATC GTGTTTCCCTA	~1500 bp	4.17	342763	1535.269265	20.57119782
FAX03132	ERS22560518	CTTGTCAGGGT TTGTGTAACCTT	~1500 bp	4.17	315149	1574.025233	20.73533656
FAX03132	ERS22560499	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	4.17	306956	1549.26436	20.61966871
FAX03132	ERS22560500	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	4.17	312879	1554.410817	20.67295098
FAX03132	ERS22560501	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	4.17	294649	1546.007154	20.6169294
FAX03132	ERS22560528	AACTAGGCACAG CGAGTCTTGTT	~1500 bp	4.17	280018	1569.042572	20.74173289
FAX03132	ERS22560529	AAGCGTTGAAAC CTTTGTCCTCTC	~1500 bp	4.17	276713	1573.345445	20.7073105
FAX03132	ERS22560525	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	4.17	284648	1555.924774	20.66670432
FAX03132	ERS22560520	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	4.17	262382	1546.392024	20.55342112
FAX03132	ERS22560522	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	4.17	317311	1563.140172	20.70181144
FAX03132	ERS22560514	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	4.17	293788	1556.519531	20.58957789
FAX03132	ERS22560435	AGGTCTACCTCG CTAACACCACTG	~1500 bp	4.17	396652	1551.092441	20.61304836
FAX03132	ERS22560519	CGTCAACTGACA GTGGTTCGTA	~1500 bp	4.17	358835	1552.046735	20.67954235
FAX03132	ERS22560523	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	4.17	283179	1553.301788	20.52652979
FAX03132	ERS22560474	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	4.17	300441	1556.302129	20.67005931
FAX03132	ERS22560515	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	4.17	253717	1555.924948	20.71434626
FAX03132	ERS22560530	TTGCGTCCTGTTA CGAGAACTCAT	~1500 bp	4.17	250979	1556.912546	20.72641532
FAX03132	ERS22560502	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	4.17	306926	1545.969615	20.78978861
FAX03132	ERS22560453	ACCACTGCCATG TATCAAAGTACG	~1500 bp	4.17	282933	1550.587712	20.59838421

FAX03132	ERS22681303	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	4.17	281344	1551.58861	20.64696144
FAX03132	ERS22560526	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	4.17	267947	1551.869265	20.66358082
FAY75183	ERS22560540	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	8.33	265735	1339.256586	21.73576623
FAY75183	ERS22560533	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	8.33	217316	1375.606251	21.74107627
FAY75183	ERS22560535	GAGTCTTGTC CCAGTTACCAGG	~1500 bp	8.33	197563	1354.535136	21.64723091
FAY75183	ERS22560536	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	8.33	223995	1392.894551	21.78878801
FAY75183	ERS22560544	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	8.33	272705	1414.854913	21.75730834
FAY75183	ERS22560538	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	8.33	269775	1401.404997	21.79444893
FAY75183	ERS22560531	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	8.33	321543	1410.354428	21.85815365
FAY75183	ERS22560542	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	8.33	278219	1365.129384	21.83039214
FAY75183	ERS22560541	AACTAGGCACAG CGAGTCTTGTT	~1500 bp	8.33	262781	1411.336938	21.8488122
FAY75183	ERS22560534	AAGCGTTGAAAC CTTGTCTCTC	~1500 bp	8.33	274798	1414.787728	21.74200664
FAY75183	ERS22560537	CAGGTAGAAAGA AGCAGAATCGGA	~1500 bp	8.33	231940	1376.931922	21.7904233
FAT93676	ERS22560545	AGAACGACTTCC ATACTCGTGTA	~1500 bp	8.33	122636	1404.494512	20.8650844
FAT93676	ERS22560539	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	8.33	142327	1380.239624	20.96013483
FAT93676	ERS22560532	AGTCTACCTCG CTAACACCACTG	~1500 bp	8.33	143872	1408.40632	20.84685046
FAT93676	ERS22560470	CGTCAACTGACA GTGGTTCGTA	~1500 bp	8.33	158000	1407.122905	20.85256563
FAT93676	ERS22560543	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	8.33	194695	1410.617545	20.81375469
FAT93676	ERS22560546	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	8.33	174233	1416.794918	20.91637285
FAT93676	ERS22560570	GTTCTCGTGCA GTGTCAAGAGAT	~1500 bp	8.33	151691	1409.937109	20.81558009
FAT93676	ERS22560561	TTGCGTCTGTTA CGAGAATCAT	~1500 bp	8.33	145935	1419.352116	20.94485819
FAT93676	ERS22560571	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	8.33	157150	1398.753484	20.89492848
FAT93676	ERS22560558	ACCACTGCCATG TATCAAAGTACG	~1500 bp	8.33	150349	1413.544786	20.89757311
FAT93676	ERS22560559	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	8.33	157193	1416.685202	20.94651257
FAT93676	ERS22560548	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	8.33	135511	1413.237877	20.91001572
FAV91537	ERS22560551	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	100	512301	1539.811597	15.85927303
FAQ48782	ERS22560557	AAGAAAGTTGTC GGTGTCTTTGTG	~1500 bp	14.29	98355	1549.088791	19.29956118
FAQ48782	ERS22560556	TCGATTCCGTTTG TAGTCGTCTGT	~1500 bp	14.29	137773	1551.901055	19.40725418
FAQ48782	ERS22560560	GAGTCTTGTC CCAGTTACCAGG	~1500 bp	14.29	98718	1532.528141	19.31097257
FAQ48782	ERS22560564	TTCGGATTCTATC GTGTTCCCTA	~1500 bp	14.29	116333	1550.886369	19.32137923
FAQ48782	ERS22560555	CTTGTCCAGGGT TTGTGTAACCTT	~1500 bp	14.29	110360	1552.990069	19.30761888
FAQ48782	ERS22560562	TTCTCGCAAAGG CAGAAAGTAGTC	~1500 bp	14.29	131172	1560.342657	19.2940132
FAQ48782	ERS22560563	GTGTTACCGTGG GAATGAATCCTT	~1500 bp	14.29	92524	1572.58053	19.39763877

FAT04025	ERS22560565	TTCAGGGAACAA ACCAAGTTACGT	~1500 bp	14.29	42997	1557.997302	17.4770891
FAT04025	ERS22560547	AACTAGGCACAG CGAGTCTTGGTT	~1500 bp	14.29	45673	1560.056554	17.51526153
FAT04025	ERS22560567	AAGCGTTGAAAC CTTGTCCCTCTC	~1500 bp	14.29	55329	1558.509823	17.47995662
FAT04025	ERS22560568	GTTTCATCTATCG GAGGGAATGGA	~1500 bp	14.29	45384	1543.864644	17.62435352
FAT04025	ERS22560256	CAGGTAGAAAAGA AGCAGAATCGGA	~1500 bp	14.29	49569	1544.125401	17.44875245
FAT04025	ERS22560569	AGAACGACTTCC ATACTCGTGTGA	~1500 bp	14.29	60372	1564.200755	17.65674518
FAT04025	ERS22560566	AACGAGTCTCTT GGGACCCATAGA	~1500 bp	14.29	71432	1556.911216	17.5232351
FAQ53656	ERS22560549	AGGTCTACCTCG CTAACACCACTG	~1500 bp	20	89072	1544.254221	18.26031952
FAQ53656	ERS22560574	CGTCAACTGACA GTGGTTCGTA	~1500 bp	20	112111	1556.567491	18.33239878
FAQ53656	ERS22560552	ACCCTCCAGGAA AGTACCTCTGAT	~1500 bp	20	121849	1554.059508	18.2077523
FAQ53656	ERS22560573	CCAAACCCAACA ACCTAGATAGGC	~1500 bp	20	108467	1557.536292	18.29521532
FAQ53656	ERS22560554	GTCCTCGTGCA GTGTCAAGAGAT	~1500 bp	20	96855	1546.157452	18.29981395
FAW15713	ERS22560572	TTGCGTCCTGTTA CGAGAACTCAT	~1500 bp	20	170877	1583.965461	19.71515851
FAW15713	ERS22560575	GAGCCTCTCATT GTCCGTTCTCTA	~1500 bp	20	222334	1553.771196	19.64426273
FAW15713	ERS22560553	ACCACTGCCATG TATCAAAGTACG	~1500 bp	20	261962	1553.926512	19.54318176
FAW15713	ERS22560576	CTTACTACCCAG TGAACCTCCTCG	~1500 bp	20	202524	1556.748292	19.54455008
FAW15713	ERS22560550	GCATAGTTCTGC ATGATGGGTTAG	~1500 bp	20	180377	1572.919857	19.66896251

12.5. Supplementary Data 5

Supplementary Data 5: Metadata for Main Cohort Analysis. Sample size 446. Pregnancy and Lactation stages category:: Pregnancy (first trimester): 0–3 weeks of post-conception day; Pregnancy (second trimester): 3–6 weeks of post-conception day; Pregnancy (third trimester): 6–9 weeks of post-conception day; Lactation (early): 0–2 weeks of postpartum day; Lactation (mid): 2–5 weeks of postpartum day; Lactation (late): 5–8 weeks of postpartum day.

This metadata was used to generate **Figures 1–5, 7, and Supplementary Figures 1–6.**

ENA sample accession	host subject ID	host age (weeks)	host age (years)	host sex	host life stage	host diet group	mother host's physiological state category	kennel	host family relationship
ERS22560115	SRTP_0_Ilka	377.29	7.24	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560116	SRTP_0_Ilka	379.14	7.27	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560117	SRTP_0_Ilka	381.43	7.31	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560118	SRTP_0_Ilka	383.14	7.35	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560119	SRTP_0_Ilka	385.29	7.39	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560120	SRTP_0_Ilka	387.14	7.42	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560121	SRTP_0_Ilka	389.57	7.47	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560122	SRTP_0_Ilka	411.86	7.89	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560123	SRTP_0_Ilka	412.00	7.90	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560124	SRTP_0_Lonci	296.71	5.69	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560125	SRTP_0_Lonci	298.57	5.72	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560126	SRTP_0_Lonci	300.86	5.77	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560127	SRTP_0_Lonci	302.71	5.80	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560128	SRTP_0_Lonci	304.71	5.84	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560129	SRTP_0_Lonci	306.57	5.88	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560130	SRTP_0_Lonci	308.86	5.92	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living

									environment, Serteperti kennel
ERS22560131	SRTP_0_Lonci	331.29	6.35	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560132	SRTP_0_Lonci	331.43	6.35	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560133	SRTP_0_Lonci	332.14	6.36	female	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560134	SRTP_0_Ajsa	273.29	5.24	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560135	SRTP_0_Ajsa	275.14	5.28	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560136	SRTP_0_Ajsa	277.43	5.32	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560137	SRTP_0_Ajsa	279.14	5.35	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560138	SRTP_0_Ajsa	281.29	5.39	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560139	SRTP_0_Ajsa	283.14	5.43	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560140	SRTP_0_Ajsa	285.29	5.47	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560141	SRTP_0_Ajsa	308.00	5.90	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560142	SRTP_0_Ajsa	308.71	5.92	female	adult	MPHC-adult	Not Applicable	Serteperti	Mother of litter E and litter G, Serteperti kennel
ERS22560143	SRTP_0_Mini	216.43	4.16	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560144	SRTP_0_Mini	218.14	4.19	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560145	SRTP_0_Mini	220.57	4.23	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560146	SRTP_0_Mini	222.29	4.27	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560147	SRTP_0_Mini	224.29	4.31	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560148	SRTP_0_Mini	226.29	4.34	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560149	SRTP_0_Mini	228.57	4.39	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560150	SRTP_0_Rozi	216.43	4.16	female	adult	MPHC-adult	Pregnancy (second trimester)	Serteperti	Mother of litter H, Serteperti kennel
ERS22560151	SRTP_0_Rozi	218.29	4.19	female	adult	MPHC-adult	Pregnancy (third trimester)	Serteperti	Mother of litter H, Serteperti kennel
ERS22560152	SRTP_0_Rozi	220.57	4.23	female	adult	MPHC-adult	Lactation (early)	Serteperti	Mother of litter H, Serteperti kennel
ERS22560153	SRTP_0_Rozi	224.43	4.31	female	adult	HPMC-adult	Lactation (mid)	Serteperti	Mother of litter H, Serteperti kennel
ERS22560154	SRTP_0_Rozi	226.29	4.34	female	adult	HPMC-adult	Lactation (late)	Serteperti	Mother of litter H, Serteperti kennel
ERS22560155	SRTP_0_Rozi	228.57	4.39	female	adult	HPMC-adult	Normal	Serteperti	Mother of litter H, Serteperti kennel
ERS22560156	SRTP_0_Rozi	251.14	4.82	female	adult	MPHC-adult	Normal	Serteperti	Mother of litter H, Serteperti kennel

ERS22560157	SRTP_0_Rozi	251.86	4.83	female	adult	MPHC-adult	Normal	Serteperti	Mother of litter H, Serteperti kennel
ERS22560158	SRTP_0_Degesz	511.00	9.80	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560159	SRTP_0_Degesz	512.71	9.83	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560160	SRTP_0_Degesz	515.14	9.88	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560161	SRTP_0_Degesz	517.00	9.91	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560162	SRTP_0_Degesz	518.86	9.95	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560163	SRTP_0_Degesz	520.86	9.98	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560164	SRTP_0_Degesz	523.14	10.03	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560165	SRTP_0_Degesz	545.57	10.46	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560166	SRTP_0_Sampo	356.71	6.84	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560167	SRTP_0_Sampo	358.57	6.87	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560168	SRTP_0_Sampo	360.86	6.92	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560169	SRTP_0_Sampo	362.57	6.95	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560170	SRTP_0_Sampo	364.57	6.99	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560171	SRTP_0_Sampo	366.57	7.03	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560172	SRTP_0_Sampo	368.86	7.07	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560173	SRTP_0_Sampo	391.43	7.50	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560174	SRTP_0_Matyí	241.71	4.64	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560175	SRTP_0_Matyí	243.43	4.67	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560176	SRTP_0_Matyí	245.86	4.71	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560177	SRTP_0_Matyí	247.57	4.75	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560178	SRTP_0_Matyí	251.71	4.83	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living

									environment, Serteperti kennel
ERS22560179	SRTP_0_Maty	276.43	5.30	male	adult	MPHC-adult	Not Applicable	Serteperti	Control adult dog, same living environment, Serteperti kennel
ERS22560181	SRTP_G_Giza	46.00	0.88	female	puppy	MPHC-puppy	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560182	SRTP_G_Giza	47.86	0.92	female	puppy	MPHC-puppy	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560183	SRTP_G_Giza	50.86	0.98	female	puppy	MPHC-puppy	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560184	SRTP_G_Giza	51.86	0.99	female	puppy	MPHC-puppy	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560185	SRTP_G_Giza	54.00	1.04	female	adult	MPHC-adult	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560186	SRTP_G_Giza	55.86	1.07	female	adult	MPHC-adult	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560187	SRTP_G_Giza	58.14	1.11	female	adult	MPHC-adult	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560188	SRTP_G_Giza	80.71	1.54	female	adult	MPHC-adult	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560189	SRTP_G_Giza	81.43	1.56	female	adult	MPHC-adult	Not Applicable	Serteperti	Puppy of Ajsa, Litter G, Serteperti kennel
ERS22560190	SRTP_H_Hobo	9.29	0.18	male	puppy	HPLC-puppy	Not Applicable	Serteperti	Puppy of Rozi, Litter H, Serteperti kennel
ERS22560191	SRTP_H_Have	6.86	0.13	male	puppy	HPLC-puppy	Not Applicable	Serteperti	Puppy of Rozi, Litter H, Serteperti kennel
ERS22560192	SRTP_H_Have	10.00	0.19	male	puppy	HPLC-puppy	Not Applicable	Serteperti	Puppy of Rozi, Litter H, Serteperti kennel
ERS22560193	SRTP_H_Have	32.43	0.62	male	puppy	MPHC-puppy	Not Applicable	Serteperti	Puppy of Rozi, Litter H, Serteperti kennel
ERS22560194	SRTP_H_Haps	6.86	0.13	male	puppy	HPLC-puppy	Not Applicable	Serteperti	Puppy of Rozi, Litter H, Serteperti kennel
ERS22560195	SRTP_H_Haps	9.43	0.18	male	puppy	HPLC-puppy	Not Applicable	Serteperti	Puppy of Rozi, Litter H, Serteperti kennel
ERS22560196	LPL_0_Guba	211.00	4.04	female	adult	HPMC-adult	Pregnancy (second trimester)	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560197	LPL_0_Guba	212.43	4.07	female	adult	HPMC-adult	Pregnancy (third trimester)	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560198	LPL_0_Guba	214.00	4.10	female	adult	HPMC-adult	Pregnancy (third trimester)	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560199	LPL_0_Guba	215.14	4.13	female	adult	HPMC-adult	Prepartum day	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560200	LPL_0_Guba	215.57	4.13	female	adult	HPMC-adult	Postpartum day	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560201	LPL_0_Guba	217.43	4.17	female	adult	HPMC-adult	Lactation (early)	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560202	LPL_0_Guba	219.43	4.21	female	adult	HPMC-adult	Lactation (mid)	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560203	LPL_0_Guba	223.57	4.29	female	adult	HPMC-adult	Lactation (late)	Le Petit Lapin	Mother of Litter P and Litter M, Le Petit Lapin Kennel
ERS22560204	LPL_0_Mizu	92.86	1.78	male	adult	HPMC-adult	Not Applicable	Le Petit Lapin	Control adult dog, same living environment, Le Patit Lapin kennel
ERS22560205	LPL_0_Mizu	94.29	1.81	male	adult	HPMC-adult	Not Applicable	Le Petit Lapin	Control adult dog, same living environment, Le Patit Lapin kennel
ERS22560206	LPL_0_Mizu	95.86	1.84	male	adult	HPMC-adult	Not Applicable	Le Petit Lapin	Control adult dog, same living environment, Le Patit Lapin kennel
ERS22560207	LPL_0_Mizu	98.86	1.89	male	adult	HPMC-adult	Not Applicable	Le Petit Lapin	Control adult dog, same living environment, Le Patit Lapin kennel
ERS22560208	LPL_0_Mizu	100.86	1.93	male	adult	HPMC-adult	Not Applicable	Le Petit Lapin	Control adult dog, same living environment, Le Patit Lapin kennel

ERS22560209	LPL_0_Mizu	106.86	2.05	male	adult	HPMC-adult	Not Applicable	Le Petit Lapin	Control adult dog, same living environment, Le Patit Lapin kennel
ERS22560210	LPL_P_Lila	0.86	0.02	female	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560211	LPL_P_Lila	2.86	0.06	female	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560212	LPL_P_Lila	5.86	0.11	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560213	LPL_P_Lila	8.14	0.16	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560214	LPL_P_Lila	10.14	0.19	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560215	LPL_P_Lila	12.14	0.23	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560216	LPL_P_Pink	0.14	0.00	female	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560217	LPL_P_Pink	1.29	0.03	female	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560218	LPL_P_Pink	5.86	0.11	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560219	LPL_P_Pink	8.14	0.16	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560220	LPL_P_Pink	9.14	0.18	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560221	LPL_P_Pink	10.14	0.19	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560222	LPL_P_Pink	12.14	0.23	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560223	LPL_P_Piros	0.86	0.02	female	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560224	LPL_P_Piros	2.86	0.06	female	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560225	LPL_P_Piros	5.86	0.11	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560226	LPL_P_Piros	8.14	0.16	female	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560227	LPL_P_Kek	0.14	0.00	male	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560228	LPL_P_Kek	0.86	0.02	male	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560229	LPL_P_Kek	2.86	0.06	male	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560230	LPL_P_Kek	8.14	0.16	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560231	LPL_P_Kek	9.14	0.18	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560232	LPL_P_Kek	10.14	0.19	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560233	LPL_P_Kek	10.29	0.20	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560234	LPL_P_Zold	0.14	0.00	male	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560235	LPL_P_Zold	0.86	0.02	male	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560236	LPL_P_Zold	2.86	0.06	male	puppy	Breast milk	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel

ERS22560237	LPL_P_Zold	7.29	0.14	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560238	LPL_P_Zold	8.14	0.16	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560239	LPL_P_Zold	10.14	0.19	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560240	LPL_P_Zold	10.57	0.20	male	puppy	HPLC-puppy	Not Applicable	Le Petit Lapin	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560251	BKCF_0_Popy	271.00	5.20	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560252	BKCF_0_Popy	275.00	5.28	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560253	BKCF_0_Popy	277.14	5.32	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560254	BKCF_0_Popy	279.00	5.35	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560255	BKCF_0_Popy	281.00	5.39	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560256	BKCF_0_Popy	282.86	5.43	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560257	BKCF_0_Popy	291.14	5.58	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560258	BKCF_0_Popy	297.14	5.70	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560259	BKCF_0_Popy	299.00	5.73	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560260	BKCF_0_Cserfes	232.86	4.47	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560261	BKCF_0_Cserfes	234.86	4.51	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560262	BKCF_0_Cserfes	236.86	4.54	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560263	BKCF_0_Cserfes	239.00	4.58	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560264	BKCF_0_Cserfes	240.86	4.62	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560265	BKCF_0_Cserfes	242.86	4.66	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560266	BKCF_0_Cserfes	244.71	4.69	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560267	BKCF_0_Cserfes	247.00	4.74	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560268	BKCF_0_Cserfes	251.43	4.82	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560269	BKCF_0_Cserfes	253.00	4.85	female	adult	MPHC-adult	Pregnancy (first trimester)	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560270	BKCF_0_Cserfes	255.29	4.89	female	adult	MPHC-adult	Pregnancy (first trimester)	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560271	BKCF_0_Cserfes	259.00	4.96	female	adult	MPHC-adult	Pregnancy (second trimester)	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel

ERS22560272	BKCF_0_Cserfes	260.86	5.00	female	adult	MPHC-adult	Pregnancy (third trimester)	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560273	BKCF_0_Cserfes	263.14	5.04	female	adult	MPHC-adult	Lactation (early)	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560274	BKCF_0_Cserfes	265.43	5.09	female	adult	MPHC-adult	Lactation (mid)	Bükki Cserfes	Mother of Litter E, Bükki Cserfes kennel
ERS22560275	BKCF_0_Alma	128.86	2.48	female	adult	MPHC-adult	Pregnancy (first trimester)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560276	BKCF_0_Alma	130.86	2.51	female	adult	MPHC-adult	Pregnancy (first trimester)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560277	BKCF_0_Alma	132.86	2.55	female	adult	MPHC-adult	Pregnancy (second trimester)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560278	BKCF_0_Alma	135.00	2.59	female	adult	MPHC-adult	Pregnancy (second trimester)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560279	BKCF_0_Alma	136.86	2.63	female	adult	MPHC-adult	Pregnancy (third trimester)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560280	BKCF_0_Alma	138.86	2.67	female	adult	MPHC-adult	Lactation (early)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560281	BKCF_0_Alma	140.71	2.70	female	adult	MPHC-adult	Lactation (mid)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560282	BKCF_0_Alma	143.00	2.74	female	adult	MPHC-adult	Lactation (mid)	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560283	BKCF_0_Alma	149.00	2.86	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560284	BKCF_0_Alma	151.29	2.90	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560285	BKCF_0_Alma	152.86	2.93	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560286	BKCF_0_Alma	155.00	2.97	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560287	BKCF_0_Alma	156.86	3.01	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560288	BKCF_0_Alma	159.14	3.05	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560289	BKCF_0_Alma	164.14	3.15	female	adult	MPHC-adult	Normal	Bükki Cserfes	Mother of Litter D, Bükki Cserfes kennel
ERS22560290	BKCF_0_Benge	81.57	1.57	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560291	BKCF_0_Benge	83.57	1.61	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560292	BKCF_0_Benge	85.57	1.64	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560293	BKCF_0_Benge	87.71	1.68	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560294	BKCF_0_Benge	89.57	1.72	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560295	BKCF_0_Benge	91.57	1.76	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560296	BKCF_0_Benge	93.43	1.79	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560297	BKCF_0_Benge	95.71	1.84	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560298	BKCF_0_Benge	104.00	1.99	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560299	BKCF_0_Benge	107.71	2.06	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel

ERS22560300	BKCF_0_Benge	109.57	2.10	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560301	BKCF_0_Benge	111.86	2.14	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560302	BKCF_0_Benge	114.14	2.19	female	adult	MPHC-adult	Not Applicable	Bükki Cserfes	Control adult dog, same living environment, Bükki Cserfes kennel
ERS22560303	BKCF_D_Datolya	9.43	0.18	female	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Alma, Litter D, Bükki Cserfes kennel
ERS22560304	BKCF_D_Datolya	15.29	0.29	female	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Alma, Litter D, Bükki Cserfes kennel
ERS22560305	BKCF_D_Dio	4.14	0.08	male	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Alma, Litter D, Bükki Cserfes kennel
ERS22560306	BKCF_D_Dio	5.00	0.09	male	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Alma, Litter D, Bükki Cserfes kennel
ERS22560307	BKCF_E_Egres	4.86	0.09	female	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Cserfes, Litter E, Bükki Cserfes kennel
ERS22560308	BKCF_E_Encian	4.86	0.09	female	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Cserfes, Litter E, Bükki Cserfes kennel
ERS22560309	BKCF_E_Eben	4.86	0.09	male	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Cserfes, Litter E, Bükki Cserfes kennel
ERS22560310	BKCF_E_Eszakias	4.86	0.09	male	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Cserfes, Litter E, Bükki Cserfes kennel
ERS22560311	BKCF_E_Edeskomeny	5.71	0.11	male	puppy	MPHC-puppy	Not Applicable	Bükki Cserfes	Puppy of Cserfes, Litter E, Bükki Cserfes kennel
ERS22560312	RR_0_Anna	212.29	4.07	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560313	RR_0_Anna	212.57	4.07	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560314	RR_0_Anna	214.71	4.11	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560315	RR_0_Anna	218.57	4.19	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560316	RR_0_Anna	220.14	4.22	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560317	RR_0_Anna	220.71	4.23	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560318	RR_0_Anna	222.57	4.27	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560319	RR_0_Anna	226.71	4.35	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560320	RR_0_Anna	273.86	5.25	female	adult	HPMC-adult	Lactation (early)	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560321	RR_0_Anna	277.57	5.32	female	adult	HPMC-adult	Lactation (mid)	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560322	RR_0_Anna	279.71	5.36	female	adult	HPMC-adult	Lactation (late)	Rezerta-Réti	Mother of Litter G, Rezerta-Réti kennel
ERS22560323	RR_0_Hanga	132.86	2.54	female	adult	HPMC-adult	Pregnancy (first trimester)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560324	RR_0_Hanga	134.14	2.57	female	adult	HPMC-adult	Pregnancy (first trimester)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560325	RR_0_Hanga	136.14	2.61	female	adult	HPMC-adult	Pregnancy (second trimester)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560326	RR_0_Hanga	138.29	2.65	female	adult	HPMC-adult	Pregnancy (third trimester)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560327	RR_0_Hanga	140.00	2.68	female	adult	HPMC-adult	Pregnancy (third trimester)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560328	RR_0_Hanga	140.14	2.68	female	adult	HPMC-adult	Prepartum day	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560329	RR_0_Hanga	142.29	2.73	female	adult	HPMC-adult	Lactation (mid)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560330	RR_0_Hanga	144.14	2.77	female	adult	HPMC-adult	Lactation (mid)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560331	RR_0_Hanga	146.14	2.80	female	adult	HPMC-adult	Lactation (late)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel

ERS22560332	RR_0_Hanga	148.29	2.84	female	adult	HPMC-adult	Lactation (late)	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560333	RR_0_Hanga	150.29	2.88	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560334	RR_0_Hanga	199.14	3.82	female	adult	HPMC-adult	Normal	Rezerta-Réti	Mother of Litter F, Rezerta-Réti kennel
ERS22560335	RR_0_Cinke	96.43	1.84	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560336	RR_0_Cinke	98.00	1.88	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560337	RR_0_Cinke	100.57	1.92	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560338	RR_0_Cinke	102.43	1.96	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560339	RR_0_Cinke	104.57	2.01	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560340	RR_0_Cinke	106.43	2.04	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560341	RR_0_Cinke	108.43	2.08	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560342	RR_0_Cinke	110.57	2.12	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560343	RR_0_Cinke	112.57	2.16	female	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560344	RR_0_Perec	86.71	1.66	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560345	RR_0_Perec	88.71	1.70	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560346	RR_0_Perec	90.71	1.73	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560347	RR_0_Perec	92.57	1.77	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560348	RR_0_Perec	94.71	1.82	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560349	RR_0_Perec	96.57	1.85	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560350	RR_0_Perec	98.57	1.89	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560351	RR_0_Perec	100.71	1.93	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560352	RR_0_Perec	104.71	2.01	male	adult	HPMC-adult	Not Applicable	Rezerta-Réti	Control adult dog, same living environment, Rezerta-Réti kennel
ERS22560353	RR_F_F agyal	3.43	0.07	female	puppy	Breast milk	Not Applicable	Rezerta-Réti	Puppy of Hanga, Litter F, Rezerta-Réti kennel
ERS22560354	RR_F_F agyal	4.57	0.09	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Rezerta-Réti	Puppy of Hanga, Litter F, Rezerta-Réti kennel
ERS22560355	RR_F_F agyal	5.86	0.12	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Rezerta-Réti	Puppy of Hanga, Litter F, Rezerta-Réti kennel

ERS22560401	RR_F_F odor	61.00	1.17	male	adult	HPMC-adult	Not Applicable	Rezerta- Réti	Puppy of Hanga, Litter F, Rezerta-Réti kennel
ERS22560402	RR_F_F odor	59.00	1.13	male	adult	HPMC-adult	Not Applicable	Rezerta- Réti	Puppy of Hanga, Litter F, Rezerta-Réti kennel
ERS22560403	RR_G_G alagonya	0.43	0.01	female	puppy	Breast milk	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560404	RR_G_G alagonya	4.43	0.08	female	puppy	Breast milk _ HPLC-puppy	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560405	RR_G_ Gyongy	1.86	0.04	female	puppy	Breast milk	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560406	RR_G_ Gyongy	4.43	0.08	female	puppy	Breast milk _ HPLC-puppy	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560407	RR_G_ Grafit	1.00	0.02	male	puppy	Breast milk	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560408	RR_G_ Grafit	3.14	0.06	male	puppy	Breast milk	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560409	RR_G_ Grafit	4.57	0.09	male	puppy	Breast milk _ HPLC-puppy	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560410	RR_G_ Grafit	6.57	0.13	male	puppy	Breast milk _ HPLC-puppy	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560411	RR_G_ Garas	0.00	0.00	male	puppy	Breast milk	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560412	RR_G_ Garas	2.71	0.05	male	puppy	Breast milk	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560413	RR_G_ Garas	4.57	0.09	male	puppy	Breast milk _ HPLC-puppy	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560414	RR_G_ Graf	1.57	0.03	male	puppy	Breast milk	Not Applicable	Rezerta- Réti	Puppy of Anna, Litter G, Rezerta-Réti kennel
ERS22560415	DMD_0 _Sugo	399.57	7.66	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B, Duna-menti Dumás kennel
ERS22560416	DMD_0 _Sugo	402.00	7.71	female	adult	MPHC-adult	Pregnancy (first trimester)	Duna- menti Dumás	Mother of Litter B, Duna-menti Dumás kennel
ERS22560417	DMD_0 _Sugo	402.43	7.71	female	adult	MPHC-adult	Pregnancy (first trimester)	Duna- menti Dumás	Mother of Litter B, Duna-menti Dumás kennel
ERS22560418	DMD_0 _Sugo	403.14	7.73	female	adult	MPHC-adult	Pregnancy (first trimester)	Duna- menti Dumás	Mother of Litter B, Duna-menti Dumás kennel
ERS22560419	DMD_0 _Sugo	422.71	8.11	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560420	DMD_0 _Sugo	462.71	8.87	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560421	DMD_0 _Sugo	464.57	8.91	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560422	DMD_0 _Sugo	466.43	8.94	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560423	DMD_0 _Sugo	468.29	8.98	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560424	DMD_0 _Sugo	470.43	9.02	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560425	DMD_0 _Sugo	472.57	9.06	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560426	DMD_0 _Sugo	473.86	9.09	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560427	DMD_0 _Sugo	476.29	9.13	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560428	DMD_0 _Sugo	476.29	9.13	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560429	DMD_0 _Sugo	478.14	9.17	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560430	DMD_0 _Sugo	482.57	9.26	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560431	DMD_0 _Sugo	484.00	9.28	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560432	DMD_0 _Sugo	486.29	9.33	female	adult	MPHC-adult	Normal	Duna- menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel

ERS22560433	DMD_0_Sugo	538.43	10.32	female	adult	MPHC-adult	Normal	Duna-menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560434	DMD_0_Sugo	541.86	10.39	female	adult	MPHC-adult	Normal	Duna-menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560435	DMD_0_Sugo	543.71	10.43	female	adult	MPHC-adult	Normal	Duna-menti Dumás	Mother of Litter B and Litter C, Duna-menti Dumás kennel
ERS22560436	DMD_0_Loki	351.14	6.73	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560437	DMD_0_Loki	375.71	7.20	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560438	DMD_0_Loki	377.00	7.22	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560439	DMD_0_Loki	379.57	7.27	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560441	DMD_0_Loki	436.71	8.37	male	adult	BARF	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560442	DMD_0_Loki	438.43	8.40	male	adult	BARF	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560443	DMD_0_Loki	440.43	8.44	male	adult	BARF	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560444	DMD_0_Loki	442.43	8.48	male	adult	BARF	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560445	DMD_0_Loki	446.29	8.56	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560446	DMD_0_Loki	450.29	8.63	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560447	DMD_0_Loki	452.14	8.67	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560448	DMD_0_Loki	456.57	8.75	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560449	DMD_0_Loki	458.00	8.78	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560450	DMD_0_Loki	460.29	8.82	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560451	DMD_0_Loki	512.57	9.82	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560452	DMD_0_Loki	515.86	9.89	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560453	DMD_0_Loki	517.71	9.92	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Control adult dog, same living environment, Duna-menti Dumás kennel
ERS22560454	DMD_B_Boszi	26.29	0.51	female	puppy	HPMC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560455	DMD_B_Boszi	49.29	0.95	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel

ERS22560456	DMD_B_Boszi	51.43	0.99	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560457	DMD_B_Boszi	52.14	1.00	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560458	DMD_B_Boszi	72.43	1.39	female	adult	BARF	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560459	DMD_B_Boszi	112.43	2.16	female	adult	BARF	Pregnancy (second trimester)	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560460	DMD_B_Boszi	114.14	2.19	female	adult	BARF	Pregnancy (third trimester)	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560461	DMD_B_Boszi	115.86	2.22	female	adult	BARF	Postpartum day	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560462	DMD_B_Boszi	116.14	2.23	female	adult	BARF	Lactation (early)	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560463	DMD_B_Boszi	118.00	2.26	female	adult	BARF	Lactation (mid)	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560464	DMD_B_Boszi	123.57	2.38	female	adult	BARF	Lactation (late)	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560465	DMD_B_Boszi	126.00	2.42	female	adult	BARF	Normal	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560466	DMD_B_Boszi	127.57	2.45	female	adult	BARF	Normal	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560467	DMD_B_Boszi	127.86	2.46	female	adult	BARF	Normal	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560468	DMD_B_Boszi	132.29	2.54	female	adult	BARF	Normal	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560469	DMD_B_Boszi	133.71	2.57	female	adult	BARF	Normal	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560470	DMD_B_Boszi	136.00	2.61	female	adult	BARF	Normal	Duna-menti Dumás	Mother of Litter D , Duna-menti Dumás kennel
ERS22560471	DMD_B_Boszi	185.86	3.57	female	adult	MPHC-adult	Lactation (early)	Duna-menti Dumás	Mother of Litter D and Litter E, Duna-menti Dumás kennel
ERS22560472	DMD_B_Boszi	188.00	3.61	female	adult	MPHC-adult	Lactation (mid)	Duna-menti Dumás	Mother of Litter D and Litter E, Duna-menti Dumás kennel
ERS22560473	DMD_B_Boszi	191.71	3.68	female	adult	MPHC-adult	Lactation (late)	Duna-menti Dumás	Mother of Litter D and Litter E, Duna-menti Dumás kennel
ERS22560474	DMD_B_Boszi	193.43	3.71	female	adult	MPHC-adult	Lactation (late)	Duna-menti Dumás	Mother of Litter D and Litter E, Duna-menti Dumás kennel
ERS22560475	DMD_B_Borcsa	25.57	0.49	female	puppy	HPMC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560476	DMD_B_Bloff	25.57	0.49	male	puppy	HPMC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560477	DMD_B_Bloff	26.29	0.51	male	puppy	HPMC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560478	DMD_B_Brios	21.43	0.41	male	puppy	HPMC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560479	DMD_B_Brios	25.71	0.50	male	puppy	HPMC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter B, Duna-menti Dumás kennel
ERS22560480	DMD_C_Csepke	62.14	1.19	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560481	DMD_C_Csepke	62.29	1.20	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560482	DMD_C_Csepke	79.71	1.53	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560483	DMD_C_Csibe	26.14	0.50	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel

ERS22560484	DMD_C_Csibe	51.43	0.99	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560485	DMD_C_Csibe	72.43	1.39	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560486	DMD_C_Cefre	10.00	0.19	male	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560488	DMD_C_Cefre	52.00	1.00	male	adult	BARF	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560490	DMD_C_Cefre	79.29	1.52	male	adult	BARF	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560491	DMD_C_Csuzli	10.00	0.19	male	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560492	DMD_C_Csuzli	27.00	0.52	male	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560493	DMD_C_Csuzli	52.43	1.01	male	adult	BARF	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560494	DMD_C_Csuzli	74.14	1.43	male	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560495	DMD_C_Coca	11.86	0.23	male	puppy	HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560496	DMD_C_Coca	52.00	1.00	male	adult	BARF	Not Applicable	Duna-menti Dumás	Puppy of Sugo, Litter C, Duna-menti Dumás kennel
ERS22560497	DMD_D_Diva	11.29	0.22	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560498	DMD_D_Piros	11.57	0.23	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560499	DMD_D_Piros	16.57	0.32	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560500	DMD_D_Piros	18.00	0.35	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560501	DMD_D_Piros	20.29	0.39	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560502	DMD_D_Piros	77.71	1.49	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560503	DMD_D_Piros	72.43	1.39	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560504	DMD_D_Piros	75.86	1.46	female	adult	MPHC-adult	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560505	DMD_D_Dilis	11.14	0.22	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560506	DMD_D_Doki	11.14	0.22	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560507	DMD_D_Dutyi	11.71	0.23	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560508	DMD_D_Detto	11.57	0.23	female	puppy	MPHC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter D, Duna-menti Dumás kennel
ERS22560509	DMD_E_Neon	2.86	0.05	male	puppy	Breast milk	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560510	DMD_E_Neon	3.43	0.06	male	puppy	Breast milk_HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560511	DMD_E_Neon	6.00	0.11	male	puppy	Breast milk_HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22681303	DMD_E_Neon	7.71	0.15	male	puppy	Breast milk_HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560512	DMD_E_Turkiz	2.57	0.05	male	puppy	Breast milk	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel

ERS22560513	DMD_E_Turkiz	3.71	0.07	male	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560514	DMD_E_Turkiz	6.14	0.12	male	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560515	DMD_E_Turkiz	7.71	0.15	male	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560516	DMD_E_Citrom	2.43	0.04	female	puppy	Breast milk	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560517	DMD_E_Citrom	3.43	0.06	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560518	DMD_E_Citrom	6.14	0.12	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560519	DMD_E_Citrom	7.71	0.15	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560520	DMD_E_Lila	3.43	0.06	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560521	DMD_E_Lila	3.71	0.07	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560522	DMD_E_Lila	6.14	0.12	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560523	DMD_E_Lila	7.71	0.15	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560524	DMD_E_Narancs	2.71	0.05	female	puppy	Breast milk	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560525	DMD_E_Narancs	6.14	0.12	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560526	DMD_E_Narancs	7.71	0.15	female	puppy	Breast milk _HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560527	DMD_E_Rozsaszin	2.57	0.05	female	puppy	Breast milk	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560528	DMD_E_Rozsaszin	3.57	0.07	female	puppy	Breast milk + HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560529	DMD_E_Rozsaszin	6.14	0.12	female	puppy	Breast milk + HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560530	DMD_E_Rozsaszin	7.71	0.15	female	puppy	Breast milk + HPLC-puppy	Not Applicable	Duna-menti Dumás	Puppy of Boszi, Litter E, Duna-menti Dumás kennel
ERS22560531	PP_0_Sari	808.29	15.49	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560532	PP_0_Sari	803.86	15.41	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560533	PP_0_Cecilia	469.14	8.99	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560534	PP_0_Cecilia	473.57	9.08	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560535	PP_0_Fancsi	311.71	5.98	female	adult	MPHC-adult	Lactation (early)	Pattogó Parázs	Mother of Litter K, Pattogó Parázs kennel
ERS22560536	PP_0_Gondor	231.57	4.44	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560537	PP_0_Gondor	236.00	4.53	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560538	PP_0_Huncut	172.86	3.31	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel

ERS22560539	PP_0_H uncut	177.29	3.40	female	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560540	PP_0_A po	639.43	12.26	male	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560541	PP_0_A po	643.86	12.34	male	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560542	PP_0_F elseg	312.43	5.99	male	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560543	PP_0_F elseg	316.86	6.07	male	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560544	PP_0_G uru	231.57	4.44	male	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560545	PP_0_G uru	236.00	4.53	male	adult	MPHC-adult	Not Applicable	Pattogó Parázs	Control adult dog, same living environment, Pattogó Parázs kennel
ERS22560546	PP_K_P iros	3.00	0.06	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560547	PP_K_P iros	4.86	0.09	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560548	PP_K_P iros	6.00	0.11	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560549	PP_K_P iros	9.00	0.17	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560550	PP_K_ Kocos	4.86	0.09	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560551	PP_K_ Kocos	6.00	0.11	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560552	PP_K_ Kocos	9.00	0.17	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560553	PP_K_ Kocos	10.00	0.19	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560554	PP_K_ Kocos	11.00	0.21	female	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560555	PP_K_B ezs	2.71	0.05	male	puppy	Breast milk	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560556	PP_K_B ezs	3.29	0.06	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560557	PP_K_B ezs	3.29	0.06	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560558	PP_K_B ezs	4.86	0.09	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560559	PP_K_B ezs	6.00	0.11	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560560	PP_K_ Kek	3.29	0.06	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560561	PP_K_ Kek	4.86	0.09	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560562	PP_K_ Kek	6.00	0.11	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560563	PP_K_ Kek	6.86	0.13	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560564	PP_K_L ila	3.43	0.07	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel

ERS22560565	PP_K_L ila	4.86	0.09	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560566	PP_K_L ila	8.86	0.17	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560567	PP_K_Z old	4.86	0.09	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560568	PP_K_Z old	6.00	0.11	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560569	PP_K_Z old	9.00	0.17	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560570	PP_K_Z old	10.00	0.19	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560571	PP_K_Z old	11.00	0.21	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560572	PP_K_ Kobold	6.00	0.11	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560573	PP_K_ Kobold	6.86	0.13	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560574	PP_K_ Kobold	9.00	0.17	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560575	PP_K_ Kobold	10.00	0.19	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel
ERS22560576	PP_K_ Kobold	11.00	0.21	male	puppy	HPMC-puppy	Not Applicable	Pattogó Parázs	Puppy of Fancsi, Litter K, Pattogó Parázs kennel

12.6. Supplementary Data 6

Supplementary Data 6: Metadata for Cesarean vs. Vaginal Sub-Group Analysis. One cesarean delivered litter comprising 5 puppies (10 samples) were compared with one vaginal delivered litter: 5 puppies (7 samples). Both litters are from the same dam and kennel (Le Petit Lapin) - matched for age (8–10 weeks) and diet. This metadata was only used to generate **Figure 6**.

ENA sample accession	host subject ID	date of birth	puppies' mode of delivery	host life stage	sample collection date	host age (weeks)	host age group	host diet group	host family relationship
ERS22560213	LPL_P_Lila	2023-06-02	Vaginally delivered	puppy	2023-07-29	8.14	week 8-10	HPLC-puppy	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560219	LPL_P_Pink	2023-06-02	Vaginally delivered	puppy	2023-07-29	8.14	week 8-10	HPLC-puppy	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560220	LPL_P_Pink	2023-06-02	Vaginally delivered	puppy	2023-08-05	9.14	week 8-10	HPLC-puppy	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560226	LPL_P_Piros	2023-06-02	Vaginally delivered	puppy	2023-07-29	8.14	week 8-10	HPLC-puppy	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560230	LPL_P_Kek	2023-06-02	Vaginally delivered	puppy	2023-07-29	8.14	week 8-10	HPLC-puppy	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560231	LPL_P_Kek	2023-06-02	Vaginally delivered	puppy	2023-08-05	9.14	week 8-10	HPLC-puppy	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560238	LPL_P_Zold	2023-06-02	Vaginally delivered	puppy	2023-07-29	8.14	week 8-10	HPLC-puppy	Puppy of Guba, Litter P, Le Patit Lapin kennel
ERS22560241	LPL_P_Zold	2024-03-08	Cesarean delivered	puppy	2024-05-06	8.43	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560242	LPL_M_Kek	2024-03-08	Cesarean delivered	puppy	2024-05-10	9.00	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560243	LPL_M_Lila	2024-03-08	Cesarean delivered	puppy	2024-05-06	8.43	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560244	LPL_M_Lila	2024-03-08	Cesarean delivered	puppy	2024-05-10	9.00	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560245	LPL_M_Narancs	2024-03-08	Cesarean delivered	puppy	2024-05-06	8.43	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560246	LPL_M_Narancs	2024-03-08	Cesarean delivered	puppy	2024-05-10	9.00	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560247	LPL_M_Piros	2024-03-08	Cesarean delivered	puppy	2024-05-06	8.43	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560248	LPL_M_Piros	2024-03-08	Cesarean delivered	puppy	2024-05-10	9.00	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560249	LPL_M_Rozsaszin	2024-03-08	Cesarean delivered	puppy	2024-05-06	8.43	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel
ERS22560250	LPL_M_Rozsaszin	2024-03-08	Cesarean delivered	puppy	2024-05-10	9.00	week 8-10	HPLC-puppy	Puppy of Guba, Litter M, Le Patit Lapin kennel

13. DATA AVAILABILITY

The sequencing raw data for 463 samples were basecalled using Dorado in super-accurate mode ($Q \geq 10$). The resulting FASTQ files have been deposited in the European Nucleotide Archive (ENA) under the BioProject accession number [PRJEB82125](#). The repository also contains the associated sample metadata.

14. ETHICS APPROVAL

In accordance with institutional and national regulations, formal animal ethics approval was not required for this study. The investigation involved only non-invasive fecal sample collection during routine husbandry practices, without any alteration to housing conditions, diet, or veterinary care. Samples were provided voluntarily by dog breeders. All procedures were conducted in compliance with applicable national animal welfare regulations.

Co-author certification

I, myself as a corresponding author of the following publication declare that the authors have no conflict of interest, and **Md Asaduzzaman** Ph.D. candidate had significant contribution to the jointly published research. The results discussed in his thesis were not used and not intended to be used in any other qualification process for obtaining a PhD degree.

05 March 2026

Date



Dr. Dóra Tombácz

last author

The publication relevant to the applicant's thesis:

Md Asaduzzaman, Péter Oláh, Natheer Jameel Yaseen, Ahmed Taifi, Tamás Járay, Gábor Gulyás, Zsolt Boldogkői, Dóra Tombácz

Longitudinal long-read microbiome profiling in a canine model reveals how age, diet, and birth mode shape gut community dynamics. *mSystems*. 2026 Feb 17;11(2):e0127925. doi: 10.1128/msystems.01279-25.