Nutritional Validation of Raw Diets

A research study conducted by Big Country Raw Ltd., 2021

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Abstract

Humanization of pet food (feeding our pets like they are family) explains a lot of new customer demands and purchasing patterns for fresh or raw pet food.

Years ago, this movement seemed a mere trend, but today, many pets seem to thrive on grain-free, home-cooked, and premade raw diets according to testimonials and industry statistics (Keller, 2017; Howarth 2021).

One of the biggest fears surrounding raw feeding from the veterinary community other than bacterial contamination, is nutrient deficiency (Freeman, 2013; Kölle 2015).

Big Country Raw, a raw pet food manufacturer based in Smithville, Ontario, is a leader in the pet food industry (Globe and Mail, 2020; Canadian Business, 2020). It is currently Canada's national raw food brand and the biggest raw manufacturing facility in Canada built to CFIA standards, and HACCP certified.

Big Country Raw is committed to providing Canadian customers and their pet specialty partners with assurances that their diets are safe and nutritionally adequate. In addition to following NRC nutrient guidelines, this research intends to provide to the industry nutritional validation of a raw diet by conducting a feeding trial.

Fifty pets, including thirty-nine dogs and eleven cats, when fed Big Country Raw diets and following an extended AAFCO feeding trial protocol, experienced no adverse effect or excessive weight gain or loss. Authors believe that with the extended health checks done during this study, the number of pets involved, the duration of the study, paired with the NRC formulation of the recipes, provides evidence for nutrient adequacy of the raw diet formulated by Big Country Raw.

MY PET eats *better* than ME.

BIG COUNTRY RAW

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The Raw Feeding Industry Challenges

There is a growing interest in feeding pets fresh and natural diets. Customers claim it is closer to meeting the biological and physiological needs of their pets. From a scientific perspective, dogs and cats are still recognized as part of the Carnivora order. Owners feel as though they should provide pets less grains and processed food, and more raw and fresh animal-based ingredients (Veterinary Report, 2020; Gyles, 2017). Humanization of pet food, feeding our pets like they are family, explains these new customer demands and purchasing patterns. Years ago, this movement seemed a mere trend, but today, many pets seem to thrive on grain-free, home-cooked, and premade raw diets according to testimonials and industry statistics (Keller, 2017; Howarth 2021). Raw pet food sales have already grown 70% from 2012 to 2016 in the United States and another 15.9% from 2016 - 2017. However, nearly 50% of raw pet food sales are not tracked, as consumers purchase direct from the manufacturer, or through smaller independent pet specialty retailers or distributors that do not track sales. For these reasons, it can be confounded that raw pet food industry sales would equate to approximately 4% of overall pet food sales. With an average growth rate of nearly 12% -16% per annum, it can be expected that the overall percentage of pet food sales will continue growing in the coming years (Keller, 2017; Howarth, 2021).

Other than individual testimonials on how feeding a raw diet improved overall health, there is very little science available to validate feeding a fresh diet over that of a processed one. In the past, scientists around the world (Dogrisk, 2018) demonstrated that feeding a fresh diet can promote and improve health in several areas such as joint development (Grundström, 2014), chronic skin issues (Anturaniemi, 2018), and allergy prevention (Hemida and al, 2020). Other than these few, many pet food studies have declared conflicts of interest with some of the industry giants (Brady, 2020). In addition, most of the nutrient requirements for dogs and cats are based on 60-year-old studies, or those requirements for other species such as rats, chickens, or pigs (NRC, 2006). Nutrient requirements are also often determined using laboratory animals fed highly purified diets (casein or soy-derived protein based) and are conducted with extract/synthetic (not whole food) forms of the tested nutrients (NRC, 2006).

Industry
Challenges

One of the biggest fears surrounding raw feeding from the veterinary community, other than bacterial contamination, is nutrient deficiency (Freeman, 2013; Kölle 2015). Pet owners can take the time to learn the basics of pet nutrition by themselves and create their own raw diet using complete and balanced meals or balanced over time approach using grocery store and butcher shop food. However, most customers are more likely to prefer to buy premade pet food in stores since it takes time, knowledge, and tools to ensure nutritional needs are met through homemade raw diets. It is, therefore, companies' responsibility to ensure that the nutritional adequacy of premade raw pet food is being met.

Canadian pet food companies who create processed or raw pre-made pet food are subject to very few regulations set forth by the Government of Canada. These regulations include Guidelines for the Advertising and Labelling of Pet Food; a voluntary guide developed to ensure consistency and accuracy on pet food labels. The guidelines also help to ensure that Canadian customers clearly understand the contents of each package of pet food.

These guidelines, an accepted standard in the pet food industry, recommend pet food labels should contain at least the following information in addition to the Consumer Packaging and Labelling Act items (Government of Canada, 2001):
- List of ingredients: listed in descending order by the percentage of weight before processing.
- Feeding instructions.
- Guaranteed analysis: information on the minimum and maximum nutritional quantities. For example, the analysis will include the maximum or minimum percentage of protein, fat, fiber, and moisture.
- Nutritional adequacy or intended life stage for which the food is suitable.

However, these are the only regulations that Canadian pet food manufacturers must adhere to when marketing or selling pet food to Canadian customers (Pet Food Association of Canada, 2022; Government of Canada, 2001). Many industry partners, including pet specialty retailers and veterinary clinics require higher standards, expecting pet food brands to provide nutritional adequacy when agreeing to resell products at their stores, as nutritional imbalance can create a lot of health issues (NRC, 2006). However, this is usually wholly voluntary and not a requirement for raw pet food brands or retail partners. There are still pet food brands (including raw and extruded) on the Canadian market that do not provide food analysis nor employ a Pet Nutrition Expert (under a contract or full-time).

Most pet food brands sold in Canada meet the minimum requirements set by the American Association of Feed Control Officials (AAFCO), especially brands that are manufactured in the United States. AAFCO is an association of agencies that propose model regulations by compiling research and information. AAFCO is not a regulatory body; it does not test, approve, or certify pet foods. Instead, it works to establish the nutritional standards for complete and balanced pet foods by setting nutrient minimums and maximums, as well as ingredients and labeling guidelines for manufacturers. Within the pet food industry, AAFCO plays a significant role in ensuring companies formulate nutritionally safe diets, thus providing "safe, effective, and useful feeds" (AAFCO, 2018).

Today, AAFCO is significantly in need of updating to provide guidelines that include the unique particularities of raw and fresh diets (lower to no cooking temperature, lower to no carbohydrate content, and lower to no preservatives, etc.) especially given the emerging raw industry. As mentioned previously, most of the science upon which the AAFCO requirements relies is

based on highly processed, high carbohydrate, high preservative, and synthetic sources of nutrients, also known as "commonly used ingredients in the industry". These factors all have an impact on bioavailability and digestibility of nutrients, and therefore can change the minimum requirements (NRC, 2006). In Annex I, it is demonstrated that the digestibility of a nutrient can make a significant difference on the actual amount needed to ensure nutritional adequacy. This is not only due to the ingredients used, but the interactions between them as well as processing.

To ensure nutritional adequacy as per AAFCO, all pet foods must meet at least one of the requirements from these categories:
- a) Formulation, either by laboratory analysis or calculation.
- b) Animal feeding trial.
- c) Family grouping (lead product member of a pet food passes a feeding trial using the AAFCO protocols and a "family member" product deemed nutritionally similar to the lead product by meeting specific nutrient and calorie criteria).

By defining these nutritional adequacy parameters, AAFCO can regulate pet food manufacturers while safeguarding the nutritional health of pets worldwide.

Some North American raw manufacturers balance their food based on the nutrient guidelines provided by AAFCO to ensure nutrient adequacy. As shown in Annex I, requirements can vary greatly, from twofold to tenfold, depending on the nutrient source and processing. Using this guideline, without investigating further on the digestibility of the ingredients used, can lead to other problems like toxicity and potentially create unexpected interactions between nutrients. For example, the zinc recommended allowance provided by the Nutrient Requirement for Dogs and Cats by the National Research Council (NRC, 2006) is at 15 mg of zinc per 1000kcal of food. This number is associated with a digestibility of 25%, a security factor for phytates (phosphorus form in vegetables used in pet food) and higher calcium to phosphorus ratio (over 2:1 is very common in adult dog food). The AAFCO requirement is at 20 mg per 1000kcal of food, meaning AAFCO used an even higher safety factor of only 20% digestibility (AAFCO, 2017). When reading through the studies that led the NRC to this recommended allowance number, it is described that zinc coming from organic sources (whole food, chelated, carbon bind minerals), with low or no phytates, and a calcium to phosphorus ratio between 2:1 and 1:1 has a digestibility of 40% to 80% depending on age of the animal and source of organic zinc (NRC, 2006). This means, that when simply following AAFCO guidelines for raw food without verifying the associated digestibility, there would be two to four times more zinc than needed. Since zinc is a micronutrient (vitamins and minerals needed by the body in very small amounts), toxicity can occur and is well documented (Ambar et al 2021, Cummings et al 2009, Mikszewski et al 2003,). As an example, zinc can interact with copper, and high levels of zinc can reduce the absorption of copper, thus creating a copper deficiency (NRC, 2006). This interaction between zinc and copper is just one example, and similar interactions can be seen between other micronutrients (Annex I). Therefore, formulating diets to follow NRC or AAFCO guidelines is a crucial first step in the process of making quality raw pet food, but more investigation is required to prove that the food is complete and balanced. Hamper et al. 2016 demonstrated that cats fed the same amount of calories from a raw diet and a processed diet showed a difference in the digestibility of the food. Cats fed the raw diet showed higher digestibility of dry matter, crude protein and gross energy, resulting in less fecal matter for the same calories ingested.

"The AAFCO Dog and Cat Food Nutrient Profiles were designed to establish practical minimum and some maximum nutrient concentrations for dog and cat foods, formulated from commonly used, non-purified, complex ingredients. (...) The fact that a dog or cat food is formulated to meet a specific AAFCO Profile should not deter or discourage the manufacturer from conducting appropriate feeding trials to further confirm and ensure the diet is nutritionally adequate for its intended use."

– AAFCO, 2017

Introduction

Big Country Raw's Commitment

Big Country Raw (raw pet food manufacturer based in Smithville, Ontario) is a leader in the raw pet food industry (Globe and Mail, 2020; Canadian Business, 2020). It is currently Canada's national raw food brand and the biggest raw manufacturing facility in Canada built to CFIA standards. Using strictly human-grade, CFIA inspected suppliers and following HACCP protocols, Big Country Raw products are the safest raw products on the Canadian market, with no mandatory recalls in ten years of business. However, superior ingredient quality and processing do not always ensure nutrient adequacy. As more and more pets grow, live, and thrive on Big Country Raw diets, the company feels the need to support their claims with science (Big Country Raw, 2021).

Big Country Raw has formulated diets to meet the nutrient requirements set forth by the National Research Council (NRC). The NRC nutrient requirement is a guide that regroups nutritional recommendations based on available science, not sponsored by the industry. AAFCO follows some of the NRC recommendations and uses extra safety factors for: commonly used ingredients (carbs, mineral and vitamin premix) and usual processing (high heat extrusion) that can lower the digestibility of the pet food (AAFCO, 2018). The digestibility of some nutrients goes from 80% to 20% depending on the nutrient, which is why safety factors must be used in the determination of the minimum requirements when formulating a processed food like kibble (Annex I). However, both guidelines provide pet owners with the assurance that the food they are providing their pet meets the daily nutrient requirements.

Big Country Raw is committed to providing Canadian customers and their pet specialty partners with the assurance that their diets are safe and nutritionally adequate. Rather than just following the AAFCO nutrient guideline or AAFCO Feeding Trial requirements (8 dogs or cats of one colony, breed, and in a controlled environment with four blood parameters analyzed), this research intends to provide a broader sample size of pets of various breeds, ages, and activity levels, that have been fed Big Country Raw for multiple years. In addition to the AAFCO requirements for a feeding trial, more elements have been added to customize the trial to include dietary record keeping, blood measurements, urinalysis, a complete biophysical profile, as well as extended pathological or clinical observation, six months apart.

Even if routine blood work cannot show vitamin or mineral deficiency (Tudor, 2013), there are ways of evaluating the health of an animal to assess possible nutrient deficiencies or toxicities. In fact, deficiency and toxicity symptoms have been well investigated for every macro and micronutrient (NRC 2006, Sanderson 2013). By conducting extended blood and urinary analysis, a complete biophysical profile, as well as extended pathological or clinical observation, veterinarians can evaluate organ function, bone and muscle development, skin and coat health, and many other physical and metabolic aspects of a healthy pet. A complete veterinary exam is the first step to evaluating dog and cat health or diagnosing a vitamin or mineral deficiency or excess. Many studies done on nutrient deficiency or excess are made by evaluating, in detail, the overall animal health to spot any known symptoms of deficiency or excess (NRC, 2006). To determine the minimum requirement on a nutrient, the method commonly used is to purposely create a deficiency and increase the amount of the nutrient until the signs of deficiency disappear (NRC, 2006). But the goal of this present study is not to determine the minimum requirement for surviving, but rather determine if dogs and cats are thriving on Big Country Raw diets (and similarly formulated raw diets in general).

The main purpose of this trial is to give Big Country Raw a nutritional validation of a raw diet as the main component of the diet of pets living their normal life. This is done in order to provide assurances to customers, pet specialty partners, and the veterinary community regarding safety and nutritional adequacy of Big Country Raw diets.

Methodology
The Participants and Their Diets

Pets

Since keeping pets crated in laboratories for the purpose of food testing and trial can be cruel for the animal, Big Country Raw decided to use pets that are kept in their homes with their families, enjoying their normal life. The pets that were chosen to participate in this trial needed to be in good health at the beginning of the trial or could have a minor health issue that did not involve taking regular drugs and medication. Other than that, the selection of pets was random regarding breeds and ages and was completely voluntary.

Participant Breakdown

41 dogs **11** cats

A total of 52 pets were used in this study. This included 41 dogs and 11 cats, aged 6 months to 14 years old, with an average age of 5 years. Pets were studied in their home, following their regular activity schedule, and fed their usual diet. No pets from this study transitioned from kibble to raw before their first vet appointment. Overall, 7 cats out of 11, and 13 dogs out of 41 had been eating Big Country Raw since their adoption (8-10 weeks old) or weaning. On average, pets in the feeding trial had been eating Big Country Raw for 3.5 years, ranging from 6 months to 8 years, prior to the first veterinary appointment. Pets lived their normal lives and had access to their normal activities during the trial. They were kept in their homes with access to their normal indoor and outdoor activities.

Diets

Dogs and cats on the feeding trial were fed exclusively Big Country Raw as their main meals: These ranged from complete recipes for dogs and cats (Dinners and Fare Game formulas), to Pure and Blend based meal recipes with supplementation added. Supplementation (Thrive Fortify) is recommended for dogs or cats on a diet of Pures and Blends to achieve NRC guidelines but was not mandatory to participate in the trial. Each participant took note for 26 weeks of the exact daily amount of food their pet ate, including everything that was not Big Country Raw food, if applicable, such as training treats. Participants were asked to make sure at least 95% of the dog's diet was Big Country Raw. The premade meal formulation descriptions above are available in Annex II. As recommended by Big Country Raw, all pets had access to whole fish or fish oil daily, or were fed a fish meal in their rotation, except for those who suffer from fish product intolerance.

All participants recorded food intake, formula fed each day of the trial, extras given like bones and treats, and any other observations worth noting. A detailed description of each formula is presented in Annex II. Ratios are an average content of meat / organs / bones / fruit and vegetable blend. Nutrient analyses of all formulas used by the participants relative to NRC standards are available in Annex IV. Analyses are based on independent laboratory testing following official CFIA references: These include protocols of food testing and sampling, as well as governmental official nutritional data taken from formulation software (Food Processor by Genesis).

The Participants

Health Check

Both veterinary appointments included a wellness evaluation (patient information, medical history and review, subjective findings, physical exam), complete blood test (hematology and serum chemistry) and urinalysis (color, turbidity, density, pH, chemical composition, cells count and solid material). All samples were sent to be analyzed directly from veterinary clinics and were not handled by Big Country Raw prior to testing. The laboratories that did the blood and urine analysis are accredited and commonly used by the veterinary community across North America (Biovet, HealthGene, Idexx). Test results were transmitted to Big Country Raw via email directly from the veterinary clinics or from the participants (official and not edited pet complete file from the veterinary clinic). The interpretations of all results were strictly provided by independent veterinary professionals and sent along with the results of testing. No participants or veterinarians received financial compensation other than reimbursement for veterinary services. Data was compiled by Julie Lauzon M. Sc. Agrologist, Pet Nutrition Expert at Big Country Raw and a second opinion was occasionally requested from Dr. Alexanne Pelletier Jean DVM, independent veterinarian.

Additional Constraints

In addition to the evaluation of overall health, and extended observation for any signs of nutrient imbalance, all participants' results also needed to follow criteria established by AAFCO, in order to achieve AAFCO standards for a "complete and balanced diet following extended feeding trial protocol" (listed below). These parameters are provided by AAFCO guidelines as minimal requirements to be able to conclude that a pet food successfully finished or failed an AAFCO feeding trial:

1. Any signs of nutritional deficiency or toxicity result in failure.
2. At least 75% of pets must successfully finish the study except for those removed for non-nutritional reasons or poor intake.
3. No individual pet loses more than 15% body weight, and the group average does not lose greater than 10% body weight results in success.
4. Hemoglobin greater than 14.0 g/dL, packed cell volume (hematocrit) is greater than 42%, albumin is greater than 2.8 g/dL and serum alkaline phosphatase (ALP) is less than 150 U/L results in success.

Results & Discussion
Health Check Findings

Diets and Participants

Two dogs left the trial for reasons that were unrelated to the trial (3.8%) before the first vet appointment. One dog did not complete the second vet appointment for reasons unrelated to the trial (excessive stress during the vet appointment). Each participant recorded the exact diet composition of their pets; 15% of dogs were fed strictly complete meals for dogs (Dinner formulas), 30% of cats were fed complete meals for cats (Fare Game formulas), 20% of dogs and 55% of cats were fed meat, organ, and bone base meal (Pure and Blend formulas) with recommended supplementation, and 65% of dogs and 10% of cats were fed a combination of the formulas (complete and meal based). Dogs and cats were also supplemented with Thrive fish oil (salmon or herring) if no fish was fed in the rotational diet, except for one cat and two dogs who had fish intolerance. Detailed recordings of the 50 pets' diets during the 26 weeks of trial are available upon request, but details are available in Annex III. When specific proteins are not mentioned, it means the pet was offered a rotation of most of the protein options available at Big Country Raw. Age of participating cats varied from 6 months to 10 years with an average of 3.5 years old. Kittens of 6 months (5 out of 11 cats) were eating Big Country Raw since weaning. Age of participating dogs varied from 8 months to 14 years with an average of 6 years old. All dogs under 2 years old were previously fed Big Country Raw for at least one year prior to the trial (8 out of 39).

The amount of food given per day is the average of the amount noted by the participants: Some dogs eating the same amount every day and others eating a different amount but balanced over time on total food intake. Food weight did not always include extras like bones, treats, and eggs. The percentage of body weight in food was calculated based on the average of the pet weight (kg) at the beginning and at the end of the trial. The pets (5 out of 50) eating less than 1.5% of actual body weight (excluding treats) were either overweight, had very low physical activity, or were suffering from joint issues (due to aging). On average, dogs ate 1.9% of body weight and cats ate 2.8%, ranging from 1.2% to 2.8% for dogs and 1.6% to 4% for cats. Small dogs ate approximately 2.5% body weight (+/- 0.5%) and large dogs ate around 1.6% body weight (+/- 0.3%). Numbers exclude treats and bones in most cases meaning, on average, the dogs ate 1.9% body weight in order to maintain ideal body score condition. Larger breeds showed to have lower calorie requirements than smaller dogs (Wang, 2011).

Excluding pets that were growing (less than one year old at first appointment), average weight variation was 4%, with an average weight loss of 5% and average weight gain of 3.8% (except for growing pets). The most significant weight loss was 14% (1 dog out of 50 dogs and cats) and highest weight gain except for growing pets was 11% (1 cat out of 50 dogs and cats).

Health Check Results

Annex III summarizes Veterinary appointment results for each pet; including wellness (general physical examinations), blood work and urinary analysis. The check marks signify that the results were within the normal range. If the results came back outside of the normal range, a veterinarian was asked to comment on the results to specify if this was significant or diet related. If the results were not significant or diet related as per the veterinarian's expertise, the results also got a checkmark.

Younger cats (6 months old at beginning of the trial) all showed higher blood mineral concentration (ex: calcium, phosphorus, and magnesium). Those were within the normal range for a growing kitten, which are known to be higher than that of adult cats (Kraft and al, 1996; Harper and al, 2003; Pineda and al, 2013). At the second

vet appointment, those mineral levels were either back to normal adult range or not significantly out of range. Those kittens showed signs of normal growth when fed their Big Country Raw diets. Results align with those of Hamper et al., 2017.

Two cats, out of 11, showed significant signs of dehydration. Cats are known for their urine concentration issues on a dry diet (Markwell and al, 1998; Buffington, 2008), but raw feeders often claim that raw diets bringing extra moisture would solve that issue. Our trial results showed that 9 cats out of 11 (82%) had enough water intake through the raw diet and free access to water to prevent dehydration. Cats are biologically efficient in water restricted environments; they have a stronger ability than dogs to concentrate their urine. This prevents excess water loss which can lead to issues like lowered instance of urinary tract diseases (Markwell and al, 1998; Zoran, 2002; Buffington, 2008). It seems that this characteristic is very present in the domestic cats fed a processed diet, and water should always be added to every meal. A raw diet does not seem to induce any

signs of dehydration or urine concentration, as per the results of this trial. Cats should always have free access to clean water, even when fed raw.

Most cats (7 out of 11) showed signs of dental disease (tartar). Cats in question were not fed raw bones in their regular diet prior to this study. Therefore, a raw diet alone, if the cat does not have access to raw meaty bones, does not prevent the apparition or formation of tartar. All kittens on the trial did not show any signs of dental disease. Two cats (2 out of 11) had high triglycerides at their two appointments due to a fasting period shorter than 12 hours (Gilor *et al*, 2011; Obsorn *et al*, 1992).

No adult cats had major weight gain or weight loss during the 6-month trial period. Only the kittens had higher weight gain due to their growth, however an ideal body condition score was maintained. The five kittens who grew on Big Country Raw diets during the trial did not show any signs of bone development issues, or any growth-related issues at either appointment.

Figure 1

Weight Variation (%) Between the Two Appointments Excluding Growing Pets
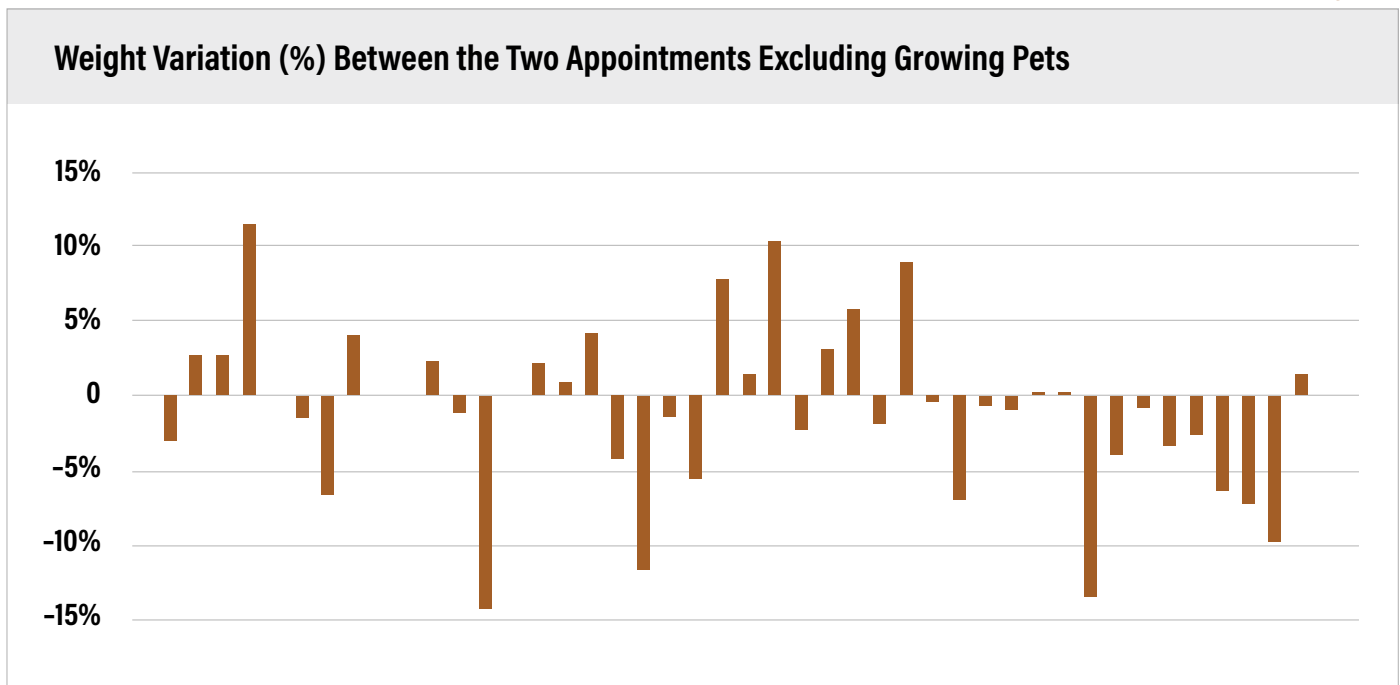
All cats finished the trial with expected results. After extended examination for pathological or clinical signs of nutrient deficiency or excess, no concerning issues or negative comments were recorded from independent veterinarians. None of the cats studied were overweight at either appointment. Skin, coat, eyes, mouth, and organ function were all found to be normal. No weight loss greater than 5% was recorded.

Thyroid gland function was not a mandatory test for this feeding trial. Some dogs did have their thyroid gland function tested by measuring T4 hormone in their bloodwork. All dogs who were tested for thyroid function came back with results within normal range.

One dog whelped and nursed a litter during the trial, which was not planned at the beginning of the trial. The bitch maintained perfect health, with food intake increasing from 1.3% of body weight to 4% of body weight at the end of pregnancy and during lactation. Following weaning, this dog's feeding amount was returned to 1.3% of body weight (excluding toppings like raw bones and treats). Further experimentation will need to be done to determine if those results can be replicable, since this feeding trial was created for "normal" growing and adult dogs.

Dogs with mild tartar at the first physical exam (2 out of 39) had an improved dental health evaluation at the second vet appointment as per physical exam comments. The majority of dogs (36 out of 39 first appointment and 39 out of 39 second appointment) had great dental health. All dogs were fed raw meaty bones on occasion which could have contributed to their dental health. Results support those found by Marx et al. 2016 and Pinto et al. 2020.

Some dogs (5 out of 39) had elevated ALT at the first appointment, which came back normal 6 months later at their second appointment. No additional dog had high ALT at the second appointment. Two dogs out of 39 had high triglycerides at the second vet appointment likely due to a fasting period shorter than the recommended 12 hours (Barnette, 2021). Two dogs out of 39 had higher pancreatic enzymes levels (lipase) at the first blood sample, but those returned to normal for the second blood sample.

Urine samples from four of the 39 dogs, all attending the same veterinary clinic, came back from the first testing with trace struvite crystals. Following further investigation, it was concluded that the crystals formed following collection during the waiting period before analysis. The clinic was more careful with the samples during the second testing, and all urine samples came back negative for struvite crystals except for one dog, but the dog showed no symptoms. This confirms the issues with the first collection – that crystals actually formed following the collection of urine due to the waiting period before testing, making the results unusable.

All dogs finished the trial with expected results for average growing or adult dogs. After extended examination for pathological or clinical signs of nutritional deficiency or excess, no concerning issues or negative comments were recorded by veterinarians. None of the dogs gained or lost weight with a greater range than 15%, with average weight change lower than 10%. Skin, coat, eye, mouth, organ function, etc. were all within normal range. Results were consistent with McCaul et al. 2020 study.

It is often said in the veterinary industry that raw fed pets tend to have higher blood urea and higher protein in their urine because of the higher protein content of the diet (Ephraim et al, 2020). Although no studies have been done to confirm if these parameters are truly different between pets that are raw fed versus those

fed a commercial extruded diet. None of the pets on the trial came back with significantly high blood urea. No more than 10% (5 out of 50) of the pets had protein in their urine higher than "trace". This could lead to the conclusion that the higher protein content of a raw diet does not necessarily imply higher pressure on the kidneys from the extra protein intake, and would agree with the results of Bovée, 1991. However, further research focused on kidney parameters and protein levels in raw diets is required in order to confirm this possibility. It also highlights that blood parameters for raw fed dogs may not be different from kibble fed dogs as it has been commonly thought.

Based on the guidelines set out by AAFCO feeding trials, the blood parameters of 94% of the pets on this trial (92% dogs (37 out of 39) and 100% cats) had results within the four set parameters for success set forth by AAFCO feeding trial guidelines (hemoglobin greater than 14.0 g/dL, packed cell volume is greater than 42%, albumin is greater than 2.8 g/dL and serum alkaline phosphatase is less than 150 U/L) resulting in success. One dog had lower packed cell volume count (35%)

in one of the two tests, the other test being normal. The veterinarian concluded the number was not significant, perhaps due to lower water intake before the blood test. One other dog had lower albumin levels on both tests (2.2g/dL and 2.4 g/dL). The veterinarian concluded it was most likely the dog's normal level, since all other blood parameters were normal as well as the wellness exam and urine analysis. Finally, one dog had higher ALP levels at both tests (203U/L and 255U/L). This dog was known for higher level of ALP prior to the trial and showed signs of fat metabolic issues (higher lipase on the first test, back to normal for the second one, and higher triglycerides on both tests) as well as low thyroid function on the first test. All these abnormalities can be associated to his breed, Miniature Schnauzer (Morin, 2021; Xenoulis, 2015). This dog will be moved to lower fat options within the Big Country Raw products, as well as supplementation for digestive support like omega-3 (Xenoulis, 2020, deAlburquerque 2021). One dog out of 39 is probably not significant, especially since the results can be breed related. It can be concluded that at least 75% of pets successfully finished the trial as per AAFCO parameters.
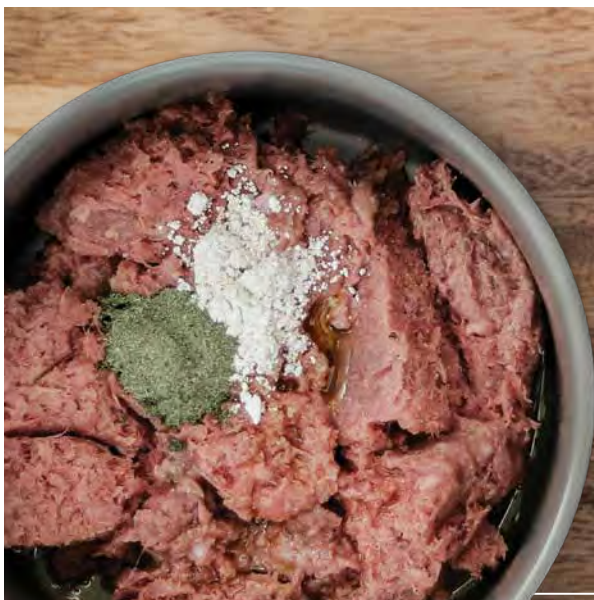
Food for pets, naturally.

Conclusion
Our Findings

No adverse effects were noted during the 26-week study period for diets including Dinners for dogs and Fare Game for cats; Both of which are formulated as complete meals and recommended for all life stages as per NRC guidelines. Additionally, meal bases (Pure and Blend formulas) when fed in a rotational meal plan and/or with recommended supplementation, did not create adverse effects during this period. The study provides evidence that raw foods can form part of a nutritionally adequate diet.

More precisely, 50 pets, including 39 dogs and 11 cats, when fed Big Country Raw diets for at least 95% of their total food intake, for a period ranging from 1 to 8 years, and following an extended AAFCO feeding trial protocol for 26 weeks, experienced no adverse effect.

Big Country Raw diets provide adequate nutrition to dogs and cats when fed according to Big Country Raw's recommendations, based on extended pathological and clinical observation.

Study Limitation & Conflict of Interest

Since this study was done at home, in an uncontrolled environment and based on the pet owner's declaration, results can be influenced by the other food pets were exposed to, as well as their overall lifestyle. Because of these many variables, and since all pets started and ended the trial in good health with no signs of nutrient deficiency or toxicity, no statistical analysis was made to support this conclusion.

Further steps for validating the nutritional adequacy of a raw diet would be to perform a feeding trial with a larger sample size (more pets), with an increased breed and life stages representation. Other investigation could include nutrient level analysis instead of extended health check: Although some methods used to determine some micronutrient levels have not yet proven accurate or have standardized methods (hair analysis as an example, Namkoong 2013). Authors believe that, with the extended health check done in this study, the number of pets involved, and the duration of the study, it is enough to provide evidence of nutrient adequacy of raw diets.

The study was funded by Big Country Raw, although no participant or veterinarian involved received any compensation for their participation in the trial. Laboratory analysis and test result interpretation were made independently of Big Country Raw.

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RAW for all
LIFE *stages*

BIG COUNTRY RAW

ANNEX I

AAFCO Requirement Versus Raw

Big Country Raw Feeding Trial 2021
Reference Guide

The word RAW is associated to commonly used ingredients in raw diets (fresh animal products: meat, organs, bones) in opposition to commonly used ingredients in the pet food industry.

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Puppy Requirements

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Adult Dog Requirements

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Kitten Requirements

23

Adult Cat Requirements

Digestibility numbers come from NRC 2006 publication and/or AAFCO's last edition : digestibility varies depending on other nutrients in the diet, such as phytates, Ca:P ratio, Zn:Cu ratio, PUFA, plant-based protein, heat processing, fiber content, added salt or chloride, etc.

Puppies

AAFCO Requirement Versus Raw

Nutrient	AAFCO Requirement	AAFCO Digestibility	Raw Digestibility	True Raw Requirement
Calcium (g)	3.00	45%	100%	1.35
Phosphorous (g)	2.50	50%	70%	1.79
Potassium (g)	1.50	55%	100%	0.83
Sodium (g)	0.80	70%	100%	0.56
Magnesium (mg)	100	45%	100%	45.00
Iron (mg)	22.00	20%	70%	6.29
Iodine (mg)	250.00	65%	75%	216.67
Copper (mg)	3.10	25%	70%	1.11
Manganese (mg)	1.80	8%	20%	0.72
Selenium (mg)	0.09	30%	60%	0.05
Zinc (mg)	25.00	16%	60%	6.67
Vitamin A (IU)	1250.00	80%	100%	1000.00
Thiamine (mg)	0.56	50%	100%	0.28
Riboflavine (mg)	1.30	80%	100%	1.04
Panthotenic Acid (mg)	3.00	80%	95%	2.53
Niacin (mg)	3.40	90%	100%	3.06
Pyriodoxine (B6) (mg)	0.38	80%	100%	0.30
Cobalamine (B12) (mg)	0.007	100%	100%	0.01
Folic Acid (mg)	0.054	100%	100%	0.05
Vitamin D (IU)	125.00	88%	100%	110.00
Vitamin E (IU)	12.50	50%	100%	6.25

Adult Dogs
AAFCO Requirement Versus Raw

Legend

Nutrients with the most significant difference between AAFCO Requirement and True Raw Requirement.

Nutrient	AAFCO Requirement	AAFCO Digestibility	Raw Digestibility	True Raw Requirement
Calcium (g)	1.25	40%	100%	0.50
Phosphorous (g)	1.00	30%	70%	0.43
Potassium (g)	1.50	50%	100%	0.75
Sodium (g)	0.20	40%	80%	0.10
Magnesium (mg)	150.00	30%	100%	45.00
Iron (mg)	10.00	20%	70%	2.86
Iodine (mg)	250.00	65%	75%	216.67
Copper (mg)	1.80	25%	70%	0.64
Manganese (mg)	1.25	10%	20%	0.63
Selenium (mg)	0.08	30%	60%	0.04
Zinc (mg)	20.00	20%	60%	6.67
Vitamin A (IU)	1250.00	80%	100%	1000.00
Thiamine (mg)	0.56	80%	100%	0.45
Riboflavine (mg)	1.30	80%	100%	1.04
Panthotenic Acid (mg)	3.00	80%	95%	2.53
Niacin (mg)	3.40	90%	100%	3.06
Pyriodoxine (B6) (mg)	0.38	80%	100%	0.30
Cobalamine (B12) (mg)	0.007	100%	100%	0.01
Folic Acid (mg)	0.054	100%	100%	0.05
Vitamin D (IU)	125.00	88%	100%	110.00
Vitamin E (IU)	12.50	50%	100%	6.25

Kittens

AAFCO Requirement Versus Raw

Nutrient	AAFCO Requirement	AAFCO Digestibility	Raw Digestibility	True Raw Requirement
Calcium (g)	2.50	40%	70%	1.43
Phosphorous (g)	2.00	60%	90%	1.33
Potassium (g)	1.50	50%	95%	0.79
Sodium (g)	0.5	60%	100%	0.30
Magnesium (mg)	200.00	25%	80%	62.50
Iron (mg)	20.00	60%	70%	17.14
Iodine (mg)	450.00	65%	90%	325.00
Copper (mg)	2.10	30%	70%	0.90
Manganese (mg)	1.90	6%	20%	0.57
Selenium (mg)	0.075	30%	60%	0.04
Zinc (mg)	18.80	20%	60%	6.27
Vitamin A (IU)	1667.00	40%	100%	666.80
Thiamine (mg)	1.40	80%	100%	1.12
Riboflavine (mg)	1.00	80%	100%	0.80
Panthotenic Acid (mg)	1.44	60%	90%	0.96
Niacin (mg)	15.00	50%	100%	7.50
Pyriodoxine (B6) (mg)	1.00	50%	100%	0.50
Cobalamine (B12) (mg)	0.005	100%	100%	0.01
Folic Acid (mg)	0.20	100%	100%	0.20
Vitamin D (IU)	70.00	40%	100%	28.00
Vitamin E (IU)	10.00	75%	100%	7.50

Adult Cats
AFFCO Requirement Versus Raw

Legend

Nutrients with the most significant difference between
AAFCO Requirement and True Raw Requirement.

Nutrient	AAFCO Requirement	AAFCO Digestibility	Raw Digestibility	True Raw Requirement
Calcium (g)	1.50	20%	70%	0.43
Phosphorous (g)	1.25	60%	90%	0.83
Potassium (g)	1.50	60%	95%	0.95
Sodium (g)	0.50	30%	85%	0.18
Magnesium (mg)	100.00	50%	80%	62.50
Iron (mg)	20.00	60%	70%	17.14
Iodine (mg)	150.00	190%	90%	316.67
Copper (mg)	1.30	30%	70%	0.56
Manganese (mg)	1.90	3%	20%	0.29
Selenium (mg)	0.075	30%	60%	0.04
Zinc (mg)	18.80	20%	60%	6.27
Vitamin A (IU)	833.00	80%	100%	666.40
Thiamine (mg)	1.40	80%	100%	1.12
Riboflavine (mg)	1.00	80%	100%	0.80
Panthotenic Acid (mg)	1.44	60%	80%	1.08
Niacin (mg)	15.00	50%	100%	7.50
Pyriodoxine (B6) (mg)	1.00	50%	100%	0.50
Cobalamine (B12) (mg)	0.005	100%	100%	0.01
Folic Acid (mg)	0.20	100%	100%	0.20
Vitamin D (IU)	70.00	40%	100%	28.00
Vitamin E (IU)	10.00	75%	100%	7.50

Canada's *favourite* raw.

ANNEX II

Recipe Composition

Big Country Raw Feeding Trial 2021
Reference Guide

Dinner Recipe Composition

Complete Meals for Dogs

Dinner Recipe Ratios

muscle meat	ground bone

70%	10%	10%	10%

organ meat | fruit & veg.
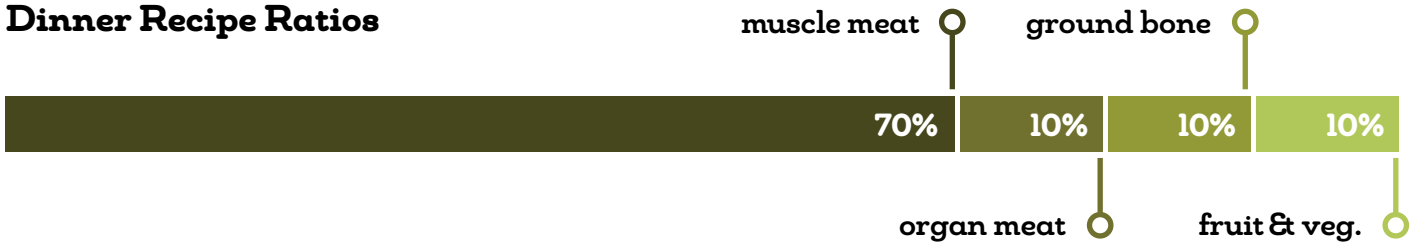
Recipe Breakdown

Recipe	Protein & Bones	Organs	Fruit, Veg. & Supplements
Chicken Dinner	Chicken meat and bones, beef heart.	Beef liver, spleen and kidney.	Proprietary fruit, vegetable and supplement blend.
Turkey Dinner	Turkey meat and bones, beef heart.	Beef liver, spleen and kidney.	Proprietary fruit, vegetable and supplement blend.
Beef Dinner	Beef meat, heart and bone dust.	Beef liver, spleen and kidney.	Proprietary fruit, vegetable and supplement blend.
Duck Dinner	Duck meat and bones, beef heart.	Beef liver, spleen and kidney.	Proprietary fruit, vegetable and supplement blend.
Bison Dinner	Bison meat and bones, buffalo meat.	Bison liver, spleen and kidney.	Proprietary fruit, vegetable and supplement blend.
Lamb Dinner	Lamb meat and bones.	Lamb liver and spleen.	Proprietary fruit, vegetable and supplement blend.
Pork Dinner	Pork meat and bones.	Pork liver, spleen and kidney.	Proprietary fruit, vegetable and supplement blend.
Fish Dinner	Salmon, haddock and cod, beef bone dust.	Beef liver, spleen and kidney.	Proprietary fruit, vegetable and supplement blend.

Fare Game Recipe Composition

Complete Meals for Cats

Fare Game Recipe Ratios

muscle meat — 75% organ meat — 15% ground bone — 10%

Recipe Breakdown

Recipe	Protein & Bones	Organs	Supplements
Chicken & Salmon with Beef	Chicken meat and bones, salmon meat, beef heart.	Beef liver, spleen and kidney.	Barley grass, wheat grass and kelp.
Quail & Duck with Lamb	Quail meat and bones, duck meat and bones, lamb heart.	Lamb liver and spleen.	Barley grass, wheat grass and kelp.
Rabbit & Pork	Rabbit meat and bones, pork heart.	Pork liver, spleen and kidney.	Barley grass, wheat grass and kelp.
Turkey & Sardines with Beef	Turkey meat and bones, sardines, beef heart.	Beef liver, spleen and kidney.	Barley grass, wheat grass and kelp.

Signature Blend Recipe Composition

Meal Base for Dogs & Cats

Signature Blend Recipe Ratios

muscle meat   ground bone

| 80% | 10% | 10% |

organ meat

Recipe Breakdown

Recipe	Protein & Bones	Organs
Breeder Blend	Chicken meat and bones, beef tripe.	Beef liver, spleen and kidney.
Country Blend	Turkey meat and bones, beef tripe.	Beef liver, spleen and kidney.
Turkey Salmon Lamb	Turkey meat and bones, salmon heart.	Lamb liver and spleen.
Game Bird Blend	Duck meat and bones, quail meat and bones, cornish hen meat and bones, pork heart.	Pork liver, spleen and kidney.

Pure Formula Recipe Composition

Meal Base for Dogs & Cats

Pure Formula Recipe Ratios

muscle meat	organ meat	ground bone
80%	10%	10%

Recipe Breakdown

Recipe	Protein & Bones	Organs
Pure Chicken	Chicken meat and bones.	Chicken liver and gizzards.
Pure Turkey	Turkey meat and bones.	Turkey liver and gizzards.
Pure Beef	Beef meat and bone dust.	Beef liver, spleen and kidney.
Pure Duck	Duck meat and bones.	Duck liver and gizzards.
Pure Kangaroo	Kangaroo meat and bones.	Kangaroo liver.
Pure Rabbit	Rabbit meat and bones.	Rabbit liver.
Pure Pork	Pork meat and bones.	Pork liver, spleen and kidney.
Pure Lamb	Lamb meat and bones.	Lamb liver and spleen.

LOVE
at first bite
BIG COUNTRY RAW

ANNEX III

Pet Descriptions and Testing Results

Big Country Raw Feeding Trial 2021
Reference Guide

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Cats
Test Results

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Dogs
Test Results

Note: Wellness evaluations and testing were conducted 12 months apart.

Cat Testing Results

Cat Descriptions

1. ISTANBUL, DOMESTIC
Male, Age: 10
Specification: Neutered
Years of Eating BCR Before Trial: 2.5
Diet: Blends, Fortify, Fish Oil.
Food per Day: 80g
Body Weight: 1.6%

2. KASHMIR, DOMESTIC
Female, Age: 10
Specification: Neutered
Years of Eating BCR Before Trial: 5.5
Diet: Blends, Fortify, Fish Oil.
Food per Day: 80g
Body Weight: 2.1%

3. SOTCHI, MAINE COON
Male, Age: 4
Specification: Neutered
Years of Eating BCR Before Trial: 2.5
Diet: Blends, Fortify, Fish Oil.
Food per Day: 150g
Body Weight: 2.1%

4. LOKI, MAINE COON
Male, Age: 3
Specification: Neutered
Years of Eating BCR Before Trial: 3
Diet: Pures, Blends, Fare Game.
Food per Day: 227g
Body Weight: 2.5%

5. LUNA, BENGAL
Female, Age: 6 months
Specification: Neutered
Years of Eating BCR Before Trial: 0.5
Diet: Pures, Blends, Fare Game.
Food per Day: 113g
Body Weight: 2.9%
See vet comments on next page.

6. ANDY, DOMESTIC
Male, Age: 6 months
Specification: Intact
Years of Eating BCR Before Trial: 0.5
Diet: Fare Game.
Food per Day: 175g
Body Weight: 3.5%
See vet comments on next page.

7. ARCHIE, DOMESTIC
Male, Age: 6 months
Specification: Neutered
Years of Eating BCR Before Trial: 0.5
Diet: Fare Game.
Food per Day: 150g
Body Weight: 2.7%
See vet comments on next page.

8. INDY, DOMESTIC
Female, Age: 6 months
Specification: Intact
Years of Eating BCR Before Trial: 0.5
Diet: Fare Game.
Food per Day: 120g
Body Weight: 2.2%
See vet comments on next page.

9. FIONA, DOMESTIC
Female, Age: 6 months
Specification: Intact
Years of Eating BCR Before Trial: 0.5
Diet: Fare Game, Pures, Pro-Gut, Goat Milk.
Food per Day: 113g
Body Weight: 4.0%
See vet comments on next page.

10. PRADA, BENGAL
Female, Age: 2.5
Specification: Spayed
Years of Eating BCR Before Trial: 2
Diet: Fare Game, Fish Oil.
Food per Day: 90g
Body Weight: 2.4%

11. WILLOW, RUSSIAN BLUE
Female, Age: 6
Specification: Spayed
Years of Eating BCR Before Trial: 4
Diet: Blends, Trimineral, Taurine, Fish
or Fish Oil.
Food per Day: 90g
Body Weight: 2.1%
See vet comments on next page.

Pet Name	Wellness Evaluation/ Diet Related Issues		Body Condition Score		Weigh In (kg)		Weight Variation	Blood Test/ Diet Related Issues		Urine Test/ Diet Related Issues	
	#1	#2	#1	#2	#1	#2		#1	#2	#1	#2
1. Istanbul	Tartar	Tartar	5/9	N/A	4.95	4.8	-3.03%	✓	✓	✓	✓
2. Kashmir	Tartar	Tartar	5/9	N/A	3.85	3.95	2.60%	✓	✓	✓	✓
3. Sotchi	Tartar	Tartar	5/9	N/A	7.21	7.4	2.64%	✓	✓	✓	✓
4. Loki	Mild Tartar	✓	3/5	4/5	8.44	9.4	11.37%	✓	✓	✓	Struvite
5. Luna	✓	✓	3/5	3.5/5	3.36	3.9	16.07%	✓	✓	✓	✓
6. Andy	Mild Tartar	Mild Tartar	2.5/5	2.5/5	4.03	4.95	22.83%	✓	✓	✓	✓
7. Archie	Mild Tartar	Mild Tartar	2.5/5	2.5/5	4.4	5.61	27.50%	✓	✓	✓	✓
8. Indy	✓	✓	2.5/5	2.5/5	2.95	5.45	84.75%	✓	✓	✓	✓
9. Fiona	✓	✓	2.5/6	2.5/5	2.4	3.3	37.50%	✓	Dehydration	✓	✓
10. Prada	Mild Tartar	Mild Tartar	5/9	5/9	3.8	3.8	0.00%	Dehydration	Dehydration	✓	✓
11. Willow	Tartar	Mild Tartar	5.5/9	5/9	4.27	4.21	-1.41%	✓	✓	✓	✓

Vet Comments

5. LUNA, BENGAL
Struvite crystalization after the sample was taken – insignificant.

6. ANDY, DOMESTIC
Weight gain = growth.

7. ARCHIE, DOMESTIC
Struvite crystalization after the sample was taken – insignificant. Weight gain = growth.

8. INDY, DOMESTIC
Struvite crystalization after the sample was taken – insignificant. Weight gain = growth.

9. FIONA, DOMESTIC
Had some digestive issues related to fish intolerance (3 weeks). Weight gain = growth.

11. WILLOW, RUSSIAN BLUE
Struvite crystalization after the sample was taken – insignificant.

Dog Testing Results

Dog Descriptions

1. NIKITA, SWISS MOUNTAIN DOG
Female, Age: 4
Specification: Intact/Pregnant
Years of Eating BCR Before Trial: 4
Diet: Pures, Blends, Fish or Fish Oil.
Food per Day: 624g
Body Weight: 1.3%
See vet comments on next page.

2. RYKER, SWISS MOUNTAIN DOG
Male, Age: 2
Specification: Intact
Years of Eating BCR Before Trial: 2
Diet: Dinners, Pures, Blends, Fish or Fish Oil.
Food per Day: 907g
Body Weight: 1.6%
See vet comments on next page.

3. MYA, AUSTRALIAN SHEPERD
Female, Age: 4
Specification: Spayed
Years of Eating BCR Before Trial: 4
Diet: Dinners, Blends, Fish Oil, Trimineral, extra bones every day.
(263g food + 30g bones)
Food per Day: 293g
Body Weight: 2.1%
See vet comments on next page.

4. SADIE, MIX BREED (SMALL)
Female, Age: 10
Specification: Intact
Years of Eating BCR Before Trial: 5
Diet: Pures, Blends, Fish or Fish Oil, extra bones every day.
(90g + 30g bones)
Food per Day: 120g
Body Weight: 2.3%

5. CASH, LABRADOR X GREAT DANE
Male, Age: 3
Specification: Neutered
Years of Eating BCR Before Trial: 3
Diet: Dinners, Pures, Blends.
Food per Day: 794g
Body Weight: 2.4%

6. BUDDY, MIXED BREED (X-LARGE)
Male, Age: 1
Specification: Neutered
Years of Eating BCR Before Trial: 1
Diet: Dinners, Blends, Pures.
Food per Day: 680g
Body Weight: 1.6%

7. LAZER, JACK RUSSEL TERRIER
Male, Age: 7
Specification: Intact
Years of Eating BCR Before Trial: 1
Diet: Dinners, Fish or Fish Oil.
Food per Day: 180g
Body Weight: 2.5%
See vet comments on next page.

8. DAISY, POODLE
Female, Age: 1
Specification: Spayed
Years of Eating BCR Before Trial: 0.5
Diet: Dinners, Hemp Oil, Green Lipped Mussels.
Food per Day: 95g
Body Weight: 2.3%

9. KACHOU, GRIFFON
Female, Age: 9 months
Specification: Intact
Years of Eating BCR Before Trial: 0.5
Diet: Dinners, Fish or Fish Oil, Chew Stick every day.
Food per Day: 604g
Body Weight: 2.8%
See vet comments on next page.

10. BARTOK, MIXED BREED (LARGE)
Male, Age: 8
Specification: Neutered
Years of Eating BCR Before Trial: 6
Diet: Dinners, Fish Oil.
Food per Day: 681g
Body Weight: 1.6%

11. CARBONE, AMERICAN STAFFORDSHIRE TERRIER X BOXER
Female, Age: 7
Specification: Spayed
Years of Eating BCR Before Trial: 4
Diet: Dinners, Fish Oil.
Food per Day: 681g
Body Weight: 2.6%

12. CHADO, GERMAN SHEPERD X HUSKY
Male, Age: 3
Specification: Neutered
Years of Eating BCR Before Trial: 1.5
Diet: Dinners, Fish or Fish Oil.
Food per Day: 680g
Body Weight: 2.1%

Pet Name	Wellness Evaluation/ Diet Related Issues		Body Condition Score		Weigh In (kg)		Weight Variation	Blood Test/ Diet Related Issues		Urine Test/ Diet Related Issues	
	#1	#2	#1	#2	#1	#2		#1	#2	#1	#2
1. Nikita	✓	✓	3/5	3/5	50.1	46.8	-6.59%	✓	✓	✓	✓
2. Ryker	✓	✓	2.5/5	4/5	55.5	57.7	3.96%	✓	✓	✓	✓
3. Mya	✓	✓	3/5	3/5	14.2	14.2	0.00%	✓	Low Hematocrit	✓	✓
4. Sadie	✓	✓	2.5/5	2.5/5	5.2	5.2	0.00%	✓	✓	✓	✓
5. Cash	✓	✓	4/9	5/9	32.5	33.2	2.15%	✓	✓	✓	✓
6. Buddy	Mild Tartar	✓	4/9	4/9	43	42.5	-1.16%	✓	✓	✓	✓
7. Lazer	Mild Tartar	Epiphora	3/5	3/5	7.7	6.6	-14.29%	High Pancreas & Liver Enzymes	✓	✓	✓
8. Daisy	Mild Tartar	✓	3/5	3/5	4.1	4.1	0.00%	✓	✓	✓	✓
9. Kachou	✓	✓	4/9	N/A	20.23	22.7	12.21%	✓	✓	✓	✓
10. Bartok	✓	✓	4/9	N/A	42.7	43.6	2.11%	✓	✓	✓	✓
11. Carbone	✓	✓	5/9	N/A	25.7	25.9	0.78%	✓	✓	✓	✓
12. Chado	✓	✓	3.5/9	3.5/5	31.7	33	4.10%	✓	✓	✓	✓

Vet Comments

1. NIKITA, SWISS MOUNTAIN DOG
Increase in food intake (4%) and weight (20%) due to pregnancy during trial.

2. RYKER, SWISS MOUNTAIN DOG
Urine crystal asymptomatic.

3. MYA, AUSTRALIAN SHEPERD
Struvite crystalization after the sample was taken – insignificant. Low hematocrit probably due to lower hydration before the 2nd test.

7. LAZER, JACK RUSSEL TERRIER
Increase physical activity, same BCS.

9. KACHOU, GRIFFON
Weight gain = growth.

Dog Testing Results Contd.

Dog Descriptions

13. JOHNNIE, BOERBOEL
Male, Age: 2
Specification: Intact
Years of Eating BCR Before Trial: 2
Diet: Dinners, Pures, Blends, Fish,
Fish Oil, Joint Support, Green Lipped
Mussels.
Food per Day: 1250g
Body Weight: 1.8%

14. JUSKEN, BEAGLE
Male, Age: 6.5
Specification: Neutered
Years of Eating BCR Before Trial: 2
Diet: Dinners and Blends, Fish, Fish Oil,
Fortify, Quail Eggs, Chicken Feet.
Food per Day: 225g
Body Weight: 1.4%

15. PITA, MIXED BREED (LARGE)
Female, Age: 8
Specification: Spayed
Years of Eating BCR Before Trial: 3.5
Diet: Dinners, Blends, Fish, Fish Oil,
Trimineral.
Food per Day: 350g
Body Weight: 1.6%

16. ESKA, MALINOIS X UNKNOWN
Female, Age: 1.5
Specification: Intact
Years of Eating BCR Before Trial: 1.5
Diet: Pures, Green Beef Tripe, Green
Lipped Mussels, Superfood Blend,
Fish, Fish Oil.
Food per Day: 322g
Body Weight: 1.7%

17. BEAR, MIXED BREED (LARGE)
Male, Age: 2
Specification: Intact
Years of Eating BCR Before Trial: 2
Diet: Dinners, Pures, Blends, Fish, Fish
Oil, Kelp, Goat Milk, Bladder support.
Food per Day: 900g
Body Weight: 2.4%

18. KANE, MIXED BREED (LARGE)
Male, Age: 8
Specification: Neutered
Years of Eating BCR Before Trial: 5.5
Diet: Dinners, Pures, Blends, Fish, Fish
Oil, Kelp, Goat Milk, Bladder Support.
Food per Day: 700g
Body Weight: 1.1%
See vet comments on next page.

19. BEGLEY, JACK RUSSEL TERRIER
Male, Age: 10
Specification: Neutered
Years of Eating BCR Before Trial: 6
Diet: Dinners, Pures, Blends, Fish,
Fish Oil, Fortify, Trimineral, Bovine
Colostrum.
Food per Day: 160g
Body Weight: 2.4%
See vet comments on next page.

20. MUNGO, JACK RUSSEL TERRIER
Male, Age: 9
Specification: Neutered
Years of Eating BCR Before Trial: 6
Diet: Dinners, Pures, Blends, Fish,
Fish Oil, Fortify, Trimineral, Bovine
Colostrum.
Food per Day: 160g
Body Weight: 2.4%

21. RICCI, BOXER
Female, Age: 6
Specification: Intact
Years of Eating BCR Before Trial: 5.5
Diet: Dinners, Pures, Blends, Fish,
Fish Oil, Fortify, Trimineral, Bovine
Colostrum.
Food per Day: 490g
Body Weight: 1.9%

22. GRACIE, ENGLISH SPRINGER SPANIEL
Female, Age: 4
Specification: Spayed
Years of Eating BCR Before Trial: 3
Diet: Dinners, Pures, Blends, Fish,
Fish Oil, Kelp, Goat Milk, Green Lipped
Mussels, Golden Paste, Bladder Support.
Food per Day: 270g
Body Weight: 2.1%
See vet comments on next page.

23. LUCY, ENGLISH SPRINGER SPANIEL
Female, Age: 11
Specification: Spayed
Years of Eating BCR Before Trial: 4
Diet: Dinners, Pures, Blends, Fish, Fish Oil,
Kelp, Goat Milk, Green Lipped Mussels,
Golden Paste, Bladder Support.
Food per Day: 250g
Body Weight: 1.2%

24. DENVER, MIXED BREED (LARGE)
Male, Age: 10
Specification: Neutered
Years of Eating BCR Before Trial: 5
Diet: Pures, Blends, Fish, Fish Oil,
Golden Paste, Goat Milk.
Food per Day: 630g
Body Weight: 1.6%
See vet comments on next page.

Pet Name	Wellness Evaluation/ Diet Related Issues		Body Condition Score		Weigh In (kg)		Weight Variation	Blood Test/ Diet Related Issues		Urine Test/ Diet Related Issues	
	#1	#2	#1	#2	#1	#2		#1	#2	#1	#2
13. Johnnie	✓	✓	3/5	2.5/5	71	68	-4.23%	✓	✓	✓	✓
14. Jusken	✓	✓	N/A	N/A	17.2	15.2	-11.63%	✓	✓	✓	✓
15. Pita	✓	✓	N/A	N/A	22.5	22.2	-1.33%	✓	✓	✓	✓
16. Eska	✓	✓	4/9	N/A	19.8	18.7	-5.56%	✓	✓	✓	✓
17. Bear	✓	✓	3/5	3/5	36.2	39	7.73%	✓	✓	✓	✓
18. Kane	High BCS	High BCS	4.5/5	4.5/5	61.5	62.3	1.30%	✓	Triglycerides	✓	✓
19. Begley	✓	✓	3/5	3/5	6.45	7.11	10.23%	Low Albumine	Low Albumine	✓	✓
20. Mungo	✓	✓	4/5	3/5	6.72	6.57	-2.23%	✓	✓	✓	✓
21. Ricci	✓	✓	3/5	3/5	25.6	26.36	2.97%	✓	✓	✓	✓
22. Gracie	✓	✓	2/5	3/5	12.3	13	5.69%	✓	✓	✓	✓
23. Lucy	✓	✓	4/5	3/5	20.9	20.5	-1.91%	✓	✓	✓	✓
24. Denver	✓	✓	N/A	4/5	38.5	41.9	8.83%	✓	✓	✓	✓

Vet Comments

18. KANE, MIXED BREED (LARGE)
Struvite crystalization after the sample was taken - insignificant, low food intake due to high BCS.

19. BEGLEY, JACK RUSSEL TERRIER
Probably the dog's normal albumine levels.

22. GRACIE, ENGLISH SPRINGER SPANIEL
Struvite crystalization after the sample was taken - insignificant.

24. DENVER, MIXED BREED (LARGE)
Weight gain joint injury lower physical activity.

Dog Testing Results Contd.

Dog Descriptions

25. AVA, GERMAN SHEPERD
Female, Age: 6
Specification: Intact
Years of Eating BCR Before Trial: 4
Diet: Dinners, Pures, Red Meat, Turkey, Kelp, Fish, Fish Oil.
Food per Day: 454g
Body Weight: 1.6%

26. KLAUS, GERMAN SHEPERD
Male, Age: 3
Specification: Intact
Years of Eating BCR Before Trial: 3
Diet: Dinners, Pures, Red Meat, Turkey, Kelp, Fish, Fish Oil.
Food per Day: 725g
Body Weight: 1.9%

27. SUMMIT, BORDER COLLIE
Male, Age: 4
Specification: Neutered
Years of Eating BCR Before Trial: 2
Diet: Dinners, Blends, Fish Oil, Raw Bones.
Food per Day: 340g
Body Weight: 2.0%

28. ESSA, MIXED (ALASKAN)
Female, Age: 5
Specification: Spayed
Years of Eating BCR Before Trial: 2
Diet: Dinners, Blends, Fish Oil, Raw Bones.
Food per Day: 565g
Body Weight: 2.5%

29. BALTO, BERNESE MOUNTAIN X HUSKY
Male, Age: 6
Specification: Neutered
Years of Eating BCR Before Trial: 4
Diet: Dinners, Pures, Blends, Superfood Blend, Fermented Vegetables, Fortify, Fish, Fish Oil, Green Lipped Mussels, Goat Milk.
Food per Day: 555g
Body Weight: 1.6%
See vet comments on next page.

30. KIELO, FINNISH LAPPHUND
Female, Age: 2
Specification: Spayed
Years of Eating BCR Before Trial: 2
Diet: Dinners, Pures, Blends, Superfood Blend, Fermented Vegetables, Fortify, Fish, Fish Oil, Green Lipped Mussels, Goat Milk.
Food per Day: 270g
Body Weight: 1.9%
See vet comments on next page.

31. BRYNN, GERMAN SHEPERD
Female, Age: 7.5
Specification: Spayed
Years of Eating BCR Before Trial: 6
Diet: Dinners, Pures, Blends, Kelp, Fish, Fish Oil, Bovine Pancreas.
Food per Day: 454g
Body Weight: 1.2%

32. LONDON, BOSTON TERRIER
Female, Age: 10
Specification: Spayed
Years of Eating BCR Before Trial: 3
Diet: Dinners, Pures, Blends, Fortify, Fish, Fish Oil, Green Lipped Mussels.
Food per Day: 227g
Body Weight: 2.3%

33. MISS DAPHNE, BEAGLE
Female, Age: 4
Specification: Spayed
Years of Eating BCR Before Trial: 4
Diet: Pures, Blends, Quail Eggs, Bones, Goat Milk.
Food per Day: 198g
Body Weight: 1.4%

34. MR. HIGGINS, SCHNAUZER
Male, Age: 9
Specification: Neutered
Years of Eating BCR Before Trial: 8
Diet: Pures, Blends, Quail Eggs, Bones, Goat Milk.
Food per Day: 198g
Body Weight: 1.5%
See vet comments on next page.

35. NYERO, MUDI
Male, Age: 9.5
Specification: Intact
Years of Eating BCR Before Trial: 6
Diet: Chicken, Turkey and Beef Dinner, Country Blend, Fish Oil, Pro-Gut, Bladder Support.
Food per Day: 368g
Body Weight: 2.1%

36. LUTRI, MUDI
Female, Age: 14
Specification: Spayed
Years of Eating BCR Before Trial: 6
Diet: Chicken, Turkey and Beef Dinner, Country Blend, Fish Oil, Pro-Gut.
Food per Day: 281g
Body Weight: 2.7%

Pet Name	Wellness Evaluation/ Diet Related Issues		Body Condition Score		Weigh In (kg)		Weight Variation	Blood Test/ Diet Related Issues		Urine Test/ Diet Related Issues	
	#1	#2	#1	#2	#1	#2		#1	#2	#1	#2
25. Ava	✓	✓	N/A	N/A	28.16	28.05	-0.39%	High ALT & AST	✓	✓	✓
26. Klaus	✓	✓	N/A	N/A	40.08	37.28	-6.99%	✓	✓	✓	✓
27. Summit	✓	✓	4/9	N/A	17.1	17	-0.58%	✓	✓	✓	✓
28. Essa	✓	✓	4/9	N/A	22.7	22.05	-0.88%	✓	✓	✓	✓
29. Balto	✓	✓	7/9	5/9	33.9	35.20	3.83%	High ALT	✓	✓	✓
30. Kielo	✓	✓	5/9	2/3	13.8	15.3	10.87%	✓	✓	✓	✓
31. Brynn	✓	✓	7/9	N/A	42	36.35	-13.45%	✓	✓	✓	✓
32. London	✓	✓	N/A	N/A	10.2	9.8	-3.92%	✓	✓	✓	✓
33. Miss Daphne	✓	✓	3.5/5	3.5/5	13.8	13.7	-0.72%	✓	✓	✓	✓
34. Mr. Higgins	✓	✓	4/5	3.5/5	13.5	13.05	-3.33%	High Lipase, High ALP, Low T4	High ALP	✓	✓
35. Nyero	✓	✓	N/A	N/A	17.6	17.2	-2.58%	✓	✓	✓	✓
36. Lutri	✓	✓	N/A	N/A	10.9	10.2	-6.28%	✓	✓	✓	✓

Vet Comments

29. BALTO, BERNESE MOUNTAIN X HUSKY
Weight increase but not BCS – muscle mass.

30. KIELO, FINNISH LAPPHUND
Weight increase but not BCS – muscle mass/growth.

34. MR. HIGGINS, SCHNAUZER
Diet modification due to fat metabolization issues probably related to the breed genetic.

Dog Testing Results Contd.

Dog Descriptions

37. KIX, MUDI
  Female, Age: 14
  Specification: Spayed
  Years of Eating BCR Before Trial: 6
  Diet: Chicken, Turkey and Beef Dinner, Country Blend, Fish Oil, Pro-Gut.
  Food per Day: N/A
  Body Weight: N/A
See vet comments on next page.

38. TENACITY, MUDI
  Female, Age: 7
  Specification: Intact
  Years of Eating BCR Before Trial: 6
  Diet: Chicken, Turkey and Beef Dinner, Country Blend, Fish Oil, Pro-Gut.
  Food per Day: 245g
  Body Weight: 2.0%

39. VIZI, MUDI
  Female, Age: 1.5
  Specification: Intact
  Years of Eating BCR Before Trial: 1.5
  Diet: Chicken, Turkey and Beef Dinner, Country Blend, Fish Oil, Pro-Gut.
  Food per Day: 178g
  Body Weight: 2.6%

Pet Name	Wellness Evaluation/ Diet Related Issues		Body Condition Score		Weigh In (kg)		Weight Variation	Blood Test/ Diet Related Issues		Urine Test/ Diet Related Issues	
	#1	#2	#1	#2	#1	#2		#1	#2	#1	#2
37. Kix	✓	✓	N/A	N/A	15.1	14	-7.23%	✓	✓	N/A	N/A
38. Tenacity	✓	✓	N/A	N/A	13	11.7	-9.79%	✓	✓	✓	✓
39. Vizi	✓	✓	N/A	N/A	6.8	6.9	1.34%	✓	✓	✓	✓

Vet Comments

37. KIX, MUDI

Left the trial after 1st appointment due to stress at the vet.

Switching **is easy**
staying is Essential.

BIG COUNTRY RAW

ANNEX IV

∩RC Charts – Dinner and Fare Game Formulas

Big Country Raw Feeding Trial 2021
Reference Guide

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Beef Dinner

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Fish Dinner

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Chicken Dinner

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Turkey Dinner

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Pork Dinner

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Lamb Dinner

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Duck Dinner

51

Bison Dinner

52 FARE_GAME

Chicken & Salmon with Beef

53 FARE_GAME

Quail & Duck with Lamb

54 FARE_GAME

Rabbit with Pork

55 FARE_GAME

Turkey & Sardines with Beef

Big Country Raw is proud to be the first Canadian brand to follow the National Research Council (NRC) Nutrient Requirements for Dogs. We use both laboratory analysis and software to ensure our raw recipes are complete and balanced to meet or exceed the nutrient requirements for your growing puppy, adult, or senior dog. All Big Country Raw recipes are formulated by our in-house accredited Pet Nutrition Expert.

Beef Dinner

Legend

✓ Meets Standards
✓✓ Exceeds Standards
💧 Low – Requires Oil

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	BEEF DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	108.80	✓✓	✓✓
Crude Fat (g)	57.60	✓✓	✓✓
Carbohydrates (g)	11.52	✓✓	✓✓
MINERALS			
Calcium (g)	3.20	✓	✓✓
Phosphorus (g)	2.90	✓	✓✓
Potassium (g)	2.45	✓✓	✓✓
Sodium (g)	0.60	✓	✓✓
Magnesium (mg)	236.25	✓✓	✓✓
Iron (mg)	24.06	✓	✓✓
Iodine (mcg)	446.33	✓✓	✓✓
Copper (mg)	4.01	✓	✓✓
Manganese (mg)	2.17	✓	✓
Selenium (mcg)	104.07	✓✓	✓✓
Zinc (mg)	23.96	✓	✓
VITAMINS			
Vitamin A (IU)	6617.40	✓✓	✓✓
Thiamine (mg)	0.50	✓	✓
Riboflavin (mg)	3.89	✓✓	✓✓
Panthotenic Acid (mg)	8.63	✓✓	✓✓
Niacin (mg)	35.87	✓✓	✓✓
Pyridoxine (mg)	2.23	✓✓	✓✓
Cobalamine (mcg)	48.92	✓✓	✓✓
Folic Acid (mcg)	395.25	✓✓	✓✓
Vitamin D (mcg)	3.29	✓	✓
Vitamin E (mg)	10.38	✓	✓
FATTY ACIDS			
LA (g)	2.90	💧	✓
EPA + DHA (g)	<0.10	💧	💧
ALA (g)	<0.30	✓	✓✓
AMINO ACIDS			
Arginine (g)	5.76	✓✓	✓✓
Cystine + Methionine (g)	9.47	✓✓	✓✓
Histidine (g)	2.05	✓✓	✓✓
Isoleucine (g)	3.52	✓✓	✓✓
Leucine (g)	7.87	✓✓	✓✓
Lysine (g)	5.82	✓✓	✓✓
Phenylanine + Tyrosine (g)	7.23	✓✓	✓✓
Threonine (g)	3.58	✓✓	✓✓
Valine (g)	4.93	✓✓	✓✓

Fish Dinner

Legend

✓ Meets Standards
✓✓ Exceeds Standards
💧 Low – Requires Oil

NUTRIENTS / 1000 KCAL	FISH DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	182.70	✓✓	✓✓
Crude Fat (g)	19.70	✓	✓
Carbohydrates (g)	17.30	✓✓	✓✓
MINERALS			
Calcium (g)	3.16	✓	✓✓
Phosphorus (g)	2.63	✓	✓✓
Potassium (g)	4.63	✓✓	✓✓
Sodium (g)	1.42	✓✓	✓✓
Magnesium (mg)	437.72	✓✓	✓✓
Iron (mg)	18.47	✓	✓✓
Iodine (mcg)	750.80	✓✓	✓✓
Copper (mg)	6.44	✓✓	✓✓
Manganese (mg)	3.52	✓✓	✓✓
Selenium (mcg)	291.55	✓✓	✓✓
Zinc (mg)	26.73	✓	✓
VITAMINS			
Vitamin A (IU)	11352.56	✓✓	✓✓
Thiamine (mg)	0.60	✓	✓
Riboflavin (mg)	2.50	✓	✓✓
Panthotenic Acid (mg)	8.87	✓✓	✓✓
Niacin (mg)	51.25	✓✓	✓✓
Pyridoxine (mg)	4.52	✓✓	✓✓
Cobalamine (mcg)	51.19	✓✓	✓✓
Folic Acid (mcg)	647.76	✓✓	✓✓
Vitamin D (mcg)	38.03	✓✓	✓✓
Vitamin E (mg)	19.43	✓✓	✓✓
FATTY ACIDS			
LA (g)	3.16	✓	✓
EPA + DHA (g)	2.42	✓✓	✓✓
ALA (g)	0.95	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	9.37	✓✓	✓✓
Cystine + Methionine (g)	22.21	✓✓	✓✓
Histidine (g)	3.16	✓✓	✓✓
Isoleucine (g)	5.89	✓✓	✓✓
Leucine (g)	10.74	✓✓	✓✓
Lysine (g)	10.74	✓✓	✓✓
Phenylanine + Tyrosine (g)	10.11	✓✓	✓✓
Threonine (g)	6.00	✓✓	✓✓
Valine (g)	7.05	✓✓	✓✓

Chicken Dinner

Legend
✓ Meets Standards
✓✓ Exceeds Standards
💧 Low – Requires Oil

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	CHICKEN DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	106.67	✓✓	✓✓
Crude Fat (g)	60.00	✓✓	✓✓
Carbohydrates (g)	11.11	✓✓	✓✓
MINERALS			
Calcium (g)	4.00	✓✓	✓✓
Phosphorus (g)	3.00	✓	✓✓
Potassium (g)	2.17	✓	✓✓
Sodium (g)	2.25	✓✓	✓✓
Magnesium (mg)	189.77	✓✓	✓✓
Iron (mg)	17.78	✓	✓✓
Iodine (mcg)	470.71	✓✓	✓✓
Copper (mg)	4.64	✓	✓✓
Manganese (mg)	2.23	✓	✓
Selenium (mcg)	75.38	✓	✓
Zinc (mg)	23.80	✓	✓
VITAMINS			
Vitamin A (IU)	6841.36	✓✓	✓✓
Thiamine (mg)	0.51	✓	✓
Riboflavin (mg)	3.02	✓✓	✓✓
Panthotenic Acid (mg)	7.39	✓	✓✓
Niacin (mg)	28.96	✓✓	✓✓
Pyridoxine (mg)	1.63	✓✓	✓✓
Cobalamine (mcg)	34.35	✓✓	✓✓
Folic Acid (mcg)	377.90	✓✓	✓✓
Vitamin D (mcg)	3.16	✓	✓
Vitamin E (mg)	10.21	✓	✓
FATTY ACIDS			
LA (g)	8.11	✓✓	✓✓
EPA + DHA (g)	<0.10	💧	💧
ALA (g)	0.61	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	4.87	✓✓	✓✓
Cystine + Methionine (g)	5.73	✓✓	✓✓
Histidine (g)	1.53	✓	✓✓
Isoleucine (g)	3.00	✓✓	✓✓
Leucine (g)	5.60	✓✓	✓✓
Lysine (g)	4.67	✓✓	✓✓
Phenylanine + Tyrosine (g)	4.07	✓	✓✓
Threonine (g)	2.20	✓✓	✓✓
Valine (g)	3.60	✓✓	✓✓

Turkey Dinner

Legend

✓ **Meets Standards**
✓✓ **Exceeds Standards**
💧 **Low – Requires Oil**

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	TURKEY DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	120.00	✓✓	✓✓
Crude Fat (g)	53.33	✓✓	✓✓
Carbohydrates (g)	12.25	✓✓	✓✓
MINERALS			
Calcium (g)	4.00	✓✓	✓✓
Phosphorus (g)	3.00	✓	✓✓
Potassium (g)	2.36	✓✓	✓✓
Sodium (g)	0.78	✓	✓✓
Magnesium (mg)	202.60	✓✓	✓✓
Iron (mg)	18.54	✓	✓✓
Iodine (mcg)	469.11	✓	✓✓
Copper (mg)	5.30	✓✓	✓✓
Manganese (mg)	3.10	✓✓	✓✓
Selenium (mcg)	98.05	✓	✓
Zinc (mg)	27.60	✓	✓
VITAMINS			
Vitamin A (IU)	8255.00	✓✓	✓✓
Thiamine (mg)	0.70	✓✓	✓✓
Riboflavin (mg)	3.54	✓✓	✓✓
Panthotenic Acid (mg)	8.03	✓✓	✓✓
Niacin (mg)	30.41	✓✓	✓✓
Pyridoxine (mg)	2.02	✓✓	✓✓
Cobalamine (mcg)	44.33	✓✓	✓✓
Folic Acid (mcg)	410.41	✓✓	✓✓
Vitamin D (mcg)	2.76	✓	✓
Vitamin E (mg)	10.10	✓	✓
FATTY ACIDS			
LA (g)	11.73	✓✓	✓✓
EPA + DHA (g)	<0.10	💧	💧
ALA (g)	0.80	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	4.60	✓✓	✓✓
Cystine + Methionine (g)	8.00	✓✓	✓✓
Histidine (g)	1.53	✓	✓✓
Isoleucine (g)	1.93	✓	✓✓
Leucine (g)	5.07	✓✓	✓✓
Lysine (g)	4.73	✓✓	✓✓
Phenylanine + Tyrosine (g)	5.27	✓✓	✓✓
Threonine (g)	2.53	✓	✓✓
Valine (g)	2.73	✓✓	✓✓

Pork Dinner

Legend

✓ **Meets Standards**
✓✓ **Exceeds Standards**
⬤ **Low – Requires Oil**

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	PORK DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	82.00	✓✓	✓✓
Crude Fat (g)	71.80	✓✓	✓✓
Carbohydrates (g)	9.70	✓✓	✓✓
MINERALS			
Calcium (g)	2.56	✓	✓✓
Phosphorus (g)	2.52	✓	✓✓
Potassium (g)	2.00	✓	✓✓
Sodium (g)	0.55	✓	✓✓
Magnesium (mg)	178.43	✓✓	✓✓
Iron (mg)	31.01	✓	✓✓
Iodine (mcg)	359.74	✓	✓✓
Copper (mg)	2.66	✓	✓
Manganese (mg)	1.82	✓	✓
Selenium (mcg)	102.91	✓	✓
Zinc (mg)	21.00	✓	✓
VITAMINS			
Vitamin A (IU)	7188.80	✓✓	✓✓
Thiamine (mg)	2.74	✓✓	✓✓
Riboflavin (mg)	3.90	✓✓	✓✓
Panthotenic Acid (mg)	8.33	✓✓	✓✓
Niacin (mg)	40.08	✓✓	✓✓
Pyridoxine (mg)	1.94	✓✓	✓✓
Cobalamine (mcg)	17.06	✓	✓✓
Folic Acid (mcg)	288.80	✓✓	✓✓
Vitamin D (mcg)	2.90	✓	✓
Vitamin E (mg)	8.38	✓	✓
FATTY ACIDS			
LA (g)	9.44	✓✓	✓✓
EPA + DHA (g)	<0.10	⬤	⬤
ALA (g)	0.51	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	4.31	✓✓	✓✓
Cystine + Methionine (g)	5.85	✓✓	✓✓
Histidine (g)	1.95	✓✓	✓✓
Isoleucine (g)	2.46	✓	✓✓
Leucine (g)	5.59	✓✓	✓✓
Lysine (g)	5.23	✓✓	✓✓
Phenylanine + Tyrosine (g)	5.64	✓✓	✓✓
Threonine (g)	2.87	✓	✓✓
Valine (g)	3.03	✓✓	✓✓

Lamb Dinner

Legend

✓ Meets Standards
✓✓ Exceeds Standards
⬤ Low – Requires Oil

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	LAMB DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	82.05	✓✓	✓✓
Crude Fat (g)	71.79	✓✓	✓✓
Carbohydrates (g)	9.13	✓✓	✓✓
MINERALS			
Calcium (g)	2.75	✓	✓✓
Phosphorus (g)	2.55	✓	✓✓
Potassium (g)	2.08	✓	✓✓
Sodium (g)	0.60	✓	✓✓
Magnesium (mg)	184.42	✓✓	✓✓
Iron (mg)	17.80	✓	✓✓
Iodine (mcg)	544.40	✓✓	✓✓
Copper (mg)	5.40	✓	✓
Manganese (mg)	3.00	✓✓	✓✓
Selenium (mcg)	85.00	✓	✓
Zinc (mg)	26.40	✓✓	✓
VITAMINS			
Vitamin A (IU)	14634.50	✓✓	✓✓
Thiamine (mg)	0.56	✓	✓
Riboflavin (mg)	2.00	✓	✓
Panthotenic Acid (mg)	4.10	✓	✓
Niacin (mg)	17.40	✓✓	✓✓
Pyridoxine (mg)	0.74	✓	✓
Cobalamine (mcg)	33.30	✓✓	✓✓
Folic Acid (mcg)	177.30	✓✓	✓✓
Vitamin D (mcg)	4.00	✓	✓
Vitamin E (mg)	46.90	✓✓	✓✓
FATTY ACIDS			
LA (g)	2.00	⬤	⬤
EPA + DHA (g)	<0.10	⬤	⬤
ALA (g)	0.92	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	3.18	✓✓	✓✓
Cystine + Methionine (g)	4.72	✓✓	✓✓
Histidine (g)	1.18	✓	✓✓
Isoleucine (g)	1.64	✓	✓✓
Leucine (g)	4.41	✓✓	✓✓
Lysine (g)	3.08	✓✓	✓✓
Phenylanine + Tyrosine (g)	4.62	✓	✓✓
Threonine (g)	2.10	✓	✓✓
Valine (g)	2.31	✓	✓✓

Duck Dinner

Legend

✓ Meets Standards
✓✓ Exceeds Standards
💧 Low – Requires Oil

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	DUCK DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	88.24	✓✓	✓✓
Crude Fat (g)	64.71	✓✓	✓✓
Carbohydrates (g)	16.63	✓✓	✓✓
MINERALS			
Calcium (g)	4.37	✓✓	✓✓
Phosphorus (g)	3.28	✓	✓✓
Potassium (g)	1.92	✓	✓
Sodium (g)	0.56	✓	✓✓
Magnesium (mg)	237.28	✓✓	✓✓
Iron (mg)	22.32	✓	✓✓
Iodine (mcg)	419.49	✓	✓✓
Copper (mg)	3.53	✓✓	✓✓
Manganese (mg)	2.41	✓	✓✓
Selenium (mcg)	121.14	✓✓	✓✓
Zinc (mg)	19.99	✓	✓
VITAMINS			
Vitamin A (IU)	7786.32	✓✓	✓✓
Thiamine (mg)	0.45	✓	✓
Riboflavin (mg)	2.98	✓✓	✓✓
Panthotenic Acid (mg)	6.16	✓	✓✓
Niacin (mg)	22.04	✓✓	✓✓
Pyridoxine (mg)	1.20	✓✓	✓✓
Cobalamine (mcg)	38.39	✓✓	✓✓
Folic Acid (mcg)	355.87	✓✓	✓✓
Vitamin D (mcg)	9.57	✓✓	✓✓
Vitamin E (mg)	8.89	✓	✓
FATTY ACIDS			
LA (g)	5.22	✓	✓✓
EPA + DHA (g)	<0.10	💧	💧
ALA (g)	0.36	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	3.18	✓✓	✓✓
Cystine + Methionine (g)	5.88	✓✓	✓✓
Histidine (g)	1.06	✓	✓✓
Isoleucine (g)	1.35	✓	✓
Leucine (g)	3.53	✓✓	✓✓
Lysine (g)	2.88	✓✓	✓✓
Phenylanine + Tyrosine (g)	3.88	✓	✓✓
Threonine (g)	1.76	✓	✓✓
Valine (g)	1.94	✓	✓✓

Bison Dinner

Legend

✓ **Meets Standards**
✓✓ **Exceeds Standards**
⬤ **Low – Requires Oil**

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	BISON DINNER	NRC PUPPY	NRC ADULT DOG
MAIN NUTRIENTS			
Crude Protein (g)	112.50	✓✓	✓✓
Crude Fat (g)	56.25	✓✓	✓✓
Carbohydrates (g)	15.63	✓✓	✓✓
MINERALS			
Calcium (g)	3.20	✓	✓✓
Phosphorus (g)	2.50	✓	✓✓
Potassium (g)	1.90	✓	✓
Sodium (g)	0.56	✓	✓✓
Magnesium (mg)	164.70	✓✓	✓✓
Iron (mg)	25.60	✓	✓✓
Iodine (mcg)	666.80	✓✓	✓✓
Copper (mg)	3.30	✓	✓✓
Manganese (mg)	1.40	✓	✓
Selenium (mcg)	90.00	✓	✓
Zinc (mg)	29.30	✓✓	✓
VITAMINS			
Vitamin A (IU)	10874.00	✓✓	✓✓
Thiamine (mg)	0.50	✓	✓
Riboflavin (mg)	2.30	✓	✓✓
Panthotenic Acid (mg)	5.60	✓	✓
Niacin (mg)	26.00	✓✓	✓✓
Pyridoxine (mg)	1.69	✓✓	✓✓
Cobalamine (mcg)	31.84	✓✓	✓✓
Folic Acid (mcg)	215.72	✓✓	✓✓
Vitamin D (mcg)	5.60	✓✓	✓✓
Vitamin E (mg)	58.00	✓✓	✓✓
FATTY ACIDS			
LA (g)	1.14	⬤	⬤
EPA + DHA (g)	<0.10	⬤	⬤
ALA (g)	<0.10	⬤	⬤
AMINO ACIDS			
Arginine (g)	6.75	✓✓	✓✓
Cystine + Methionine (g)	11.07	✓✓	✓✓
Histidine (g)	2.43	✓✓	✓✓
Isoleucine (g)	4.12	✓✓	✓✓
Leucine (g)	9.25	✓✓	✓✓
Lysine (g)	6.82	✓✓	✓✓
Phenylanine + Tyrosine (g)	8.44	✓✓	✓✓
Threonine (g)	4.19	✓✓	✓✓
Valine (g)	5.74	✓✓	✓✓

Chicken & Salmon with Beef

Legend

✓ Meets Standards
✓✓ Exceeds Standards
🜄 Low – Requires Oil

NUTRIENTS / 1000 KCAL	CHICKEN & SALMON WITH BEEF	NRC KITTEN	NRC ADULT CAT
MAIN NUTRIENTS			
Crude Protein (g)	134.2	✓✓	✓✓
Crude Fat (g)	51.7	✓✓	✓✓
Carbohydrates (g)	4.9	✓✓	✓✓
MINERALS			
Calcium (g)	3.8	✓✓	✓✓
Phosphorus (g)	3.0	✓✓	✓✓
Potassium (g)	1.9	✓	✓
Sodium (g)	0.9	✓✓	✓✓
Magnesium (mg)	119.4	✓✓	✓✓
Iron (mg)	27.8	✓	✓
Iodine (mcg)	456.0	✓	✓
Copper (mg)	6.2	✓✓	✓✓
Manganese (mg)	1.2	✓	✓
Selenium (mcg)	160.0	✓✓	✓✓
Zinc (mg)	18.8	✓	✓
VITAMINS			
Vitamin A (IU)	12232.0	✓✓	✓✓
Thiamine (mg)	1.1	✓	✓
Riboflavin (mg)	3.7	✓✓	✓✓
Panthotenic Acid (mg)	9.1	✓✓	✓✓
Niacin (mg)	49.9	✓✓	✓✓
Pyridoxine (mg)	1.9	✓✓	✓✓
Cobalamine (mcg)	56.8	✓✓	✓✓
Folic Acid (mcg)	208.3	✓	✓
Vitamin K (mg)	0.4	✓	✓
Vitamin D (mcg)	13.8	✓✓	✓✓
Vitamin E (mg)	36.7	✓✓	✓✓
FATTY ACIDS			
LA (g)	2.3	✓	✓
EPA + DHA (g)	2.2	✓	✓
ALA (g)	2.3	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	6.87	✓✓	✓✓
Cystine + Methionine (g)	12.22	✓✓	✓✓
Histidine (g)	2.32	✓✓	✓✓
Isoleucine (g)	4.25	✓✓	✓✓
Leucine (g)	8.43	✓✓	✓✓
Lysine (g)	7.18	✓✓	✓✓
Phenylanine + Tyrosine (g)	7.37	✓	✓
Threonine (g)	7.07	✓✓	✓✓
Valine (g)	5.38	✓✓	✓✓
Taurine (g)	0.29	✓✓	✓✓

Quail & Duck with Lamb

FARE GAME · BIGCOUNTRYRAW

Legend

✓ **Meets Standards**
✓✓ **Exceeds Standards**
🌢 **Low – Requires Oil**

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	QUAIL & DUCK WITH LAMB	NRC KITTEN	NRC ADULT CAT
MAIN NUTRIENTS			
Crude Protein (g)	117.4	✓✓	✓✓
Crude Fat (g)	55.4	✓✓	✓✓
Carbohydrates (g)	10.61	✓✓	✓✓
MINERALS			
Calcium (g)	6.29	✓✓	✓✓
Phosphorus (g)	4.81	✓✓	✓✓
Potassium (g)	3.42	✓✓	✓✓
Sodium (g)	0.56	✓	✓✓
Magnesium (mg)	226.80	✓✓	✓✓
Iron (mg)	36.12	✓	✓
Iodine (mcg)	457.33	✓	✓
Copper (mg)	6.02	✓✓	✓✓
Manganese (mg)	1.23	✓	✓
Selenium (mcg)	131.04	✓✓	✓
Zinc (mg)	23.90	✓	✓
VITAMINS			
Vitamin A (IU)	19117.9	✓✓	✓✓
Thiamine (mg)	1.1	✓	✓
Riboflavin (mg)	4.5	✓✓	✓✓
Panthotenic Acid (mg)	9.0	✓✓	✓✓
Niacin (mg)	33.2	✓✓	✓✓
Pyridoxine (mg)	2.0	✓✓	✓✓
Cobalamine (mcg)	59.5	✓✓	✓✓
Folic Acid (mcg)	149.1	✓	✓
Vitamin K (mg)	0.3	✓	✓
Vitamin D (mcg)	9.2	✓✓	✓✓
Vitamin E (mg)	33.6	✓✓	✓✓
FATTY ACIDS			
LA (g)	8.90	✓✓	✓✓
EPA + DHA (g)	<0,1	🌢	🌢
ALA (g)	0.90	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	4.21	✓✓	✓✓
Cystine + Methionine (g)	7.17	✓✓	✓✓
Histidine (g)	1.47	✓✓	✓✓
Isoleucine (g)	1.85	✓	✓
Leucine (g)	5.08	✓	✓
Lysine (g)	3.86	✓✓	✓✓
Phenylanine + Tyrosine (g)	5.57	✓	✓
Threonine (g)	2.53	✓	✓
Valine (g)	2.64	✓✓	✓✓
Taurine (g)	0.36	✓✓	✓✓

Rabbit with Pork

Legend

✓ Meets Standards
✓✓ Exceeds Standards
💧 Low – Requires Oil

For recipes that do not contain fish, supplementing with Thrive Herring Oil, Salmon Oil, or Hemp Seed Oil is required for essential fatty acids (LA, ALA, EPA, DHA).

NUTRIENTS / 1000 KCAL	RABBIT WITH PORK	NRC KITTEN	NRC ADULT CAT
MAIN NUTRIENTS			
Crude Protein (g)	123.8	✓✓	✓✓
Crude Fat (g)	52.3	✓✓	✓✓
Carbohydrates (g)	11.02	✓✓	✓✓
MINERALS			
Calcium (g)	6.8	✓✓	✓✓
Phosphorus (g)	5.2	✓✓	✓✓
Potassium (g)	2.1	✓	✓✓
Sodium (g)	0.4	✓	✓
Magnesium (mg)	245.0	✓✓	✓✓
Iron (mg)	43.6	✓✓	✓✓
Iodine (mcg)	471.6	✓	✓
Copper (mg)	1.6	✓	✓
Manganese (mg)	1.2	✓	✓
Selenium (mcg)	79.8	✓✓	✓
Zinc (mg)	26.7	✓	✓
VITAMINS			
Vitamin A (IU)	19211.1	✓✓	✓✓
Thiamine (mg)	1.4	✓	✓
Riboflavin (mg)	4.5	✓✓	✓✓
Panthotenic Acid (mg)	9.7	✓✓	✓✓
Niacin (mg)	25.2	✓✓	✓✓
Pyridoxine (mg)	1.2	✓✓	✓✓
Cobalamine (mcg)	26.7	✓✓	✓✓
Folic Acid (mcg)	163.6	✓	✓
Vitamin K (mg)	0.6	✓	✓
Vitamin D (mcg)	3.6	✓✓	✓✓
Vitamin E (mg)	36.8	✓✓	✓✓
FATTY ACIDS			
LA (g)	2.50	✓	✓
EPA + DHA (g)	<0,1	💧	💧
ALA (g)	0.20	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	5.49	✓✓	✓✓
Cystine + Methionine (g)	9.41	✓✓	✓✓
Histidine (g)	2.24	✓✓	✓✓
Isoleucine (g)	2.46	✓✓	✓✓
Leucine (g)	6.62	✓✓	✓✓
Lysine (g)	6.44	✓✓	✓✓
Phenylanine + Tyrosine (g)	6.56	✓	✓
Threonine (g)	3.31	✓✓	✓✓
Valine (g)	3.63	✓✓	✓✓
Taurine (g)	0.3	✓✓	✓✓

Turkey & Sardines with Beef

Legend

✓ Meets Standards
✓✓ Exceeds Standards
💧 Low – Requires Oil

NUTRIENTS / 1000 KCAL	TURKEY & SARDINES WITH BEEF	NRC KITTEN	NRC ADULT CAT
MAIN NUTRIENTS			
Crude Protein (g)	143.5	✓✓	✓✓
Crude Fat (g)	46.2	✓✓	✓✓
Carbohydrates (g)	12.84	✓✓	✓✓
MINERALS			
Calcium (g)	3.7	✓✓	✓✓
Phosphorus (g)	2.8	✓✓	✓✓
Potassium (g)	1.7	✓	✓
Sodium (g)	0.8	✓✓	✓✓
Magnesium (mg)	100.5	✓✓	✓✓
Iron (mg)	31.7	✓	✓
Iodine (mcg)	480.2	✓	✓
Copper (mg)	3.8	✓✓	✓✓
Manganese (mg)	1.2	✓	✓
Selenium (mcg)	124.0	✓✓	✓
Zinc (mg)	20.2	✓	✓
VITAMINS			
Vitamin A (IU)	8761.7	✓✓	✓✓
Thiamine (mg)	1.3	✓	✓
Riboflavin (mg)	3.3	✓✓	✓✓
Panthotenic Acid (mg)	7.6	✓✓	✓✓
Niacin (mg)	38.8	✓✓	✓✓
Pyridoxine (mg)	1.7	✓✓	✓✓
Cobalamine (mcg)	40.6	✓✓	✓✓
Folic Acid (mcg)	156.2	✓	✓
Vitamin K (mg)	524.3	✓✓	✓✓
Vitamin D (mcg)	7.8	✓✓	✓✓
Vitamin E (mg)	36.0	✓✓	✓✓
FATTY ACIDS			
LA (g)	5.40	✓✓	✓✓
EPA + DHA (g)	1.10	✓✓	✓✓
ALA (g)	0.40	✓✓	✓✓
AMINO ACIDS			
Arginine (g)	6.35	✓✓	✓✓
Cystine + Methionine (g)	11.44	✓✓	✓✓
Histidine (g)	2.17	✓✓	✓✓
Isoleucine (g)	3.29	✓✓	✓✓
Leucine (g)	7.46	✓✓	✓✓
Lysine (g)	6.60	✓✓	✓✓
Phenylanine + Tyrosine (g)	7.42	✓	✓
Threonine (g)	3.75	✓✓	✓✓
Valine (g)	4.52	✓✓	✓✓
Taurine	0.56	✓✓	✓✓