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ARTICLE

Feline Diets: How Food Composition and Processing Can Affect Health and Behavior

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Abstract
Cats are commonly labeled as being neurologically wired to have issues with stress, disregarding the worthy evolution of this species. Of course, early socialization, experiences, and environmental influences must be acknowledged with a cat's disposition and mental fitness. But to imply a defect of the species ignores the most fundamental building block in health and life expectancy, the cornerstone in the cause and development of disease and behavior disorders: diet.

The cat is an obligate carnivore, even acknowledged as a hypercarnivore, whose unique and specific nutrient requirements are provided naturally in prey – a diet composed primarily of animal tissue. Nevertheless, today's cats are fueled by commercial foods formulated with ingredients more for omnivores claiming to address everything from balanced nutrition, shiny fur, and a healthy gut to high energy, healthy weight, immune support, stress, and more. Then why the prevalence of health and behavior issues? Human and animal studies link diet — especially ultra-processed diets — to chronic diseases and disorders of the brain including mental illness, violence, and intellectual abilities.

The majority of commercial cat foods are processed or ultra-processed. So, while our cats may be protected from starvation and known nutrient deficiencies, high consumption of these commercially processed foods appear to be responsible for a range of issues in our cats: overfeeding and undernourishment, adverse reactions to foods, changes in the microbiome, systemic inflammation, and in turn affecting the gut-brain axis, the central nervous system, and the brain.

Introduction
The feline's wild ancestors are known to be obligate carnivores, surviving on a variety of prey. Investigations of whole prey diets reveal nutritive properties beyond macro and micronutrients set by the National Research Council (NRC), as well as critical non-nutritive assets (Plantinga et al., 2011). From raw animal-derived fermentative substances that enhance the gut ecosystem and boost immune health to the full experience of nourishment: the hunt, catch, ingestion, and the fulfillment of nutrient needs.

However, most cats today are fed modern commercial diets, derived from by-products of the human food processing industry (Alessandri et al., 2020) using poorer quality meats, rendered meals, and increasingly more plant proteins, which then undergo multiple processing methods altering the taste, texture, and appearance into something not found in nature. Nor providing many intrinsic building blocks necessary for the brain, the central nervous system (CNS), and the gut-brain axis (GBA) that can address behavioral issues such as aggression, hyper-alertness, and stress induced stereotypies (Homer et al., 2023).

The cat's brain shares some remarkable similarities with the human brain. As with humans, their brain is composed of gray and white matter; the temporal, occipital, frontal, and parietal lobes of their cerebral cortex are similar with each region connected in the same

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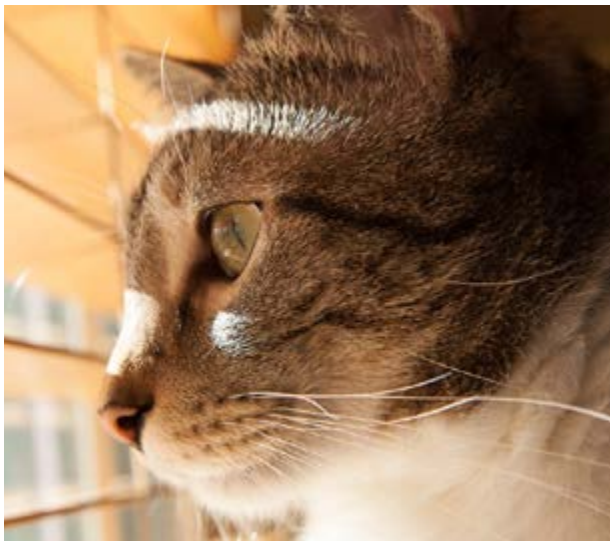
way. Cats appear to think and make decisions just as humans do, receiving input from the basic five senses – touch, smell, hearing, sight, and taste – and conveying and processing that data (Cornell CatWatch, 2019). Can we argue that, as with humans, diet has a direct effect on learning, memory, and cognition (Reichelt et al., 2017)?

Until the 1960s, cats lived outdoors or were allowed to go outside and roam freely, supplementing their diets with fresh prey, as many were kept for vermin control. This gradually changed thanks to the invention of kitty litter, a growing market of canned and packaged cat food, their new role as family members, and rising concern for their safety out of doors.

Thus, when cats moved into our homes from the wild, we promised a safer environment with a reliable source of food promised to rival Mother Nature's. In the decades since, while being protected from trauma and infectious diseases, over 60 percent of our cats are overweight or obese and health and behavior issues are on the rise. Veterinarians, pet foods, carbohydrates, fats, lack of exercise, lifestyle – all have been blamed (Kardinaal et al., 2000; Zoran, 2002; Michel & Scherk, 2012). The fault is that we missed how cats still have three out of four paws steadfastly rooted in their wild origins. In domesticating this obligate carnivore, we demanded they adapt to human lifestyles and our diet preferences while disregarding their innate needs and evolutionary physiology for convenience, economics, and social mores.



The Diet of an Obligate Carnivore

In the wild, cats rely on a diet based primarily on animal tissues to meet their specific nutritional requirements (Wortinger, 2010). Natural prey diets offer 52 - 63 percent of calories from protein, 36 - 46 percent of calories from fat, and 2 - 12 percent of calories from carbohydrates (Plantinga et al., 2011; Laflamme et al., 2022). A diet to which the cat's metabolic system has adapted meets their specific need for high amounts of dietary amino acids, as naturally found in nutrient dense muscle meat and organs. A study using feral cats for their close genetics with domestic cats (Plantinga et al., 2011) demonstrated that cats have maintained a unique and sensitive mechanism to consume an overall dietary macronutrient profile close to their evolutionary diet. In other words, the cat has changed little anatomically, metabolically, and behaviorally.

The cat's natural prey forages a diverse plant ecology offering phytochemicals and fatty acid compositions known to have anti-inflammatory, immuno-modulating, anti-carcinogenic, cardioprotective, and neuroprotective effects (Plantinga et al., 2011; van Vliet et al., 2021). While there is minimal data on nutrient profiles and digestibility of wild prey, there are a few comparisons. For example, in feedlot animals the omega-6 to omega-3 fatty acid ratio ranges between 6:1 and 19:1. A diet based on wild prey contains a ratio of about 2:1 (Plantinga et al., 2011).

Commercially prepared kibble is made from captive or feedlot animals resulting in ratios of 5:1 or 10:1 (Plantinga et al., 2011). The Association of American Feed Control Officials (AAFCO) – the independent organization that guides state, federal and international feed regulators with ingredient definitions, label standards and laboratory standards – recommends the omega 6:3 ratio be less than 30:1 with omega-6 fatty acids typically sourced from grain-fed meat, but are also found in high concentrations in corn, soy and other plant oils. Differences also exist in vitamins and trace minerals. Absorption of minerals, such as calcium and phosphorus, is less in prey than the forms used in commercial feline diets, such as inorganic phosphates (Summers et al., 2020).

So how is it that most foods promoted to cat owners and caregivers are the inverse of the cat's nutritional, instinctual, and sensory needs? To understand, we need to step back through history to recognize the influences that created today's cat foods, and how the prevalence of nutritional reductionism did not take note of the complexity of the whole food matrix in their natural diet.

Pet Food History – Upcycling to Gold Standard

While we think upcycling – the reuse of discarded objects or material in such a way as to create a product of higher quality or value than the original – is a new development in recent years, pet industry history tells a different story. Pet food manufacturers have sourced human food production by-products as early as the 1860s, when Spratt invented the first commercial dog biscuit, and ever since spun them into pet food mainstays. But it was Purina that changed pet food manufacturing forever with the introduction of extrusion technology in 1956, delivering the kibble shaped food we know today. Foods that were shelf stable, convenient, energy dense, and inexpensive due to the grain-based agribusiness roots utilizing vegetable and soy proteins for meat substitutions: an influence founded in feed conversion rate and intake, and less about companion animal health needs and behavior (Homer et al., 2023). By 1963, the first extruded cat food was on the market, but combined with production requirements for starches to bind the kibble, these new foods offered poorer quality proteins, a wider variety of fats, and higher levels of carbohydrates than a cat's natural prey (Zoran, 2002). Early kibble formulas were also deficient in critical nutrients (Maugh II, 1987), but by 2006 these diets were entrenched and promoted as the panacea for discriminating felines, when NRC released revised guidelines. But it was the authority of the Pet Food Institute (1958) and UK Pet Food (formerly Pet Food Manufacturer Association [1970]) that elevated the importance and superiority of feeding commercially processed foods. It can be argued these organizations and others raised the quality of processed food and their research improved pet food standards, but their impact was a turning point: commercially processed pet foods were now promoted as the only thing owners should feed their pets with all other diets dismissed as substandard, not ideal, and potentially dangerous (Lauson-Jones, n.d.).

Reductionism vs. Whole Food Matrix

The updated NRC guidelines isolated the unique dietary requirements of this obligate carnivore, including arachidonic acid, Vitamin A, many Vitamin Bs, taurine, and arginine, found naturally in animal sources. Yet, as found in human nutrition reductionism, the focus was on individual nutrients and calories. While these nutrient specifications helped prevent deficiencies and malnutrition, food ingredients, the degree of processing, and the effects on the nutrient composition and the food matrix were overlooked.

Foods need to be viewed as a whole, not as a collection of parts. The USDA database tracks approximately 150 nutritional compounds, yet if we look at the whole food matrix, the food metabolome contains an estimated 70,000 unique metabolites that are potentially capable of impacting health, individually or synergistically (FooDB, 2024; Barabási et al., 2020). Nutrients behave differently when included in natural matrices than when added in the artificial matrices of ultra processed recombined foods (Fardet & Rock, 2018). Food processing breaks down and destroys the complex structures of plant and animal cells, allowing abnormally rapid absorption. Until recently, the impact of this increased accessibility received little attention, but given

the new knowledge of the microbiome, the significant shift in nutrient accessibility cannot be discounted.

Processed or Ultra-processed? NOVA Food Classification

Foods are more than the sum of nutrients and in recognizing that formulations and processing must be considered (Thorning et al., 2017), the NOVA Food Classification system was developed assigning foods to four groups to help people understand how much industrial processing the foods have undergone: 1) unprocessed or minimally processed foods, 2) processed culinary ingredients, 3) processed foods, and 4) ultra-processed food and drink products (Monteiro et al., 2018). Even though NOVA classifications can be somewhat limiting, employing the same guidelines, pet foods can be categorized as minimally processed, processed, or ultra-processed: fresh, freeze-dried, gently cooked, dehydrated, and canned would be classified as minimally processed to processed, and extruded dry food as ultra-processed. Ultra-processed foods (UPFs) are defined as multi-ingredient industrial formulations made mostly from or entirely from substances derived from foods and additives, or substances not normally used in home food preparation such as meat or grain meals, hydrogenated oils, protein isolate, casein, and gluten, retaining little or none of their original food characteristics (Monteiro et al., 2019). To complicate matters, individual ingredients can also be rendered, preprocessed, or fractionated then added to a food. Advocates of rendered meals and fractionated ingredients used in the manufacturing of pet foods argue the sustainability – environmental, social, and economic – by utilizing by-products that would otherwise be treated as food waste and reducing the carbon footprint used to feed our companion animals (Zijlstra et al., 2004; Wilkinson & Meeker, 2021).

Except, human studies reveal the higher the consumption of UPFs, the higher the risk of chronic diseases even multimorbidity including obesity (Poti et al., 2017), heart disease (Srour et al., 2020), cancer (Chang et al., 2023), type 2 diabetes (Srour et al., 2019), asthma (Melo et al., 2018), and anxiety (Lane et al., 2022). Causes for the adverse outcomes of UPFs being investigated include nutrient composition and energy density, hyper-availability of nutrients, industrial processing methods, dietary reconstitution, additives and the effects on the gut microbiome, harmful manufacturing by-products, or packaging contamination.

So, What Does This Have to do with Cat Health and Behavior?

The majority of commercial cat foods are processed or ultra-processed. Heating, pasteurizing, canning, and air drying or freeze drying, are all forms of processing. Extrusion, by the NOVA food classification system, is regarded as ultra-processing, making extruded kibble or dry foods ultra-processed. Pet food manufacturers use cooking, such as with starch gelatinization, to help with digestibility and bioavailability of nutrients, but excess heat and processing can degrade nutrients. The heating of plant-sourced ingredients destroys trypsin inhibitors. Yet, prolonged heating reduces digestibility of crude protein and amino acids, such as lysine and arginine (Li & Wu, 2023). Processed and ultra-processed pet foods undergo extensive heat treatment during production that leads to advanced glycation end products (AGEs), which are dependent on cooking time, temperature, and the absence of moisture (Goldberg et al., 2004). While studies have shown AGEs are associated with cognitive impairment and mental disorders in humans (D'Cunha et al., 2022), the average intake of AGEs is 38 times higher for cats than humans (van Rooijen et al., 2014). Even added supplementation often needed to meet standardized requirements, digestibility, bioavailability, production, and

sourcing qualities can reduce absorption of any or all of the above. Non-essential nutrients, like phytochemicals, that bring healthful benefits, may not be replaced.

Studies show that anywhere from 70 to 90 percent of cats are fed kibble (Wall et al., 2019; Ganz et al., 2022) either alone or in combination with wet food and in rare cases, raw. Kibble or dry foods are typically formulated from meals, flours, starches, glutens, protein isolates or concentrates, and added vitamins and minerals. Ingredients have been subjected to multiple processing methods altering their taste, texture, and appearance, and rendering the food unlike any natural prey.

Even meeting the NRC macro and micronutrients, commercial formulas do not take into account the in-depth food matrix leave gaping disparities when compared to the in-depth matrix of nutrients in the cat's natural diet of a variety of whole prey. For example, the following ingredients are found in two popular grocery brands: chicken, chicken by-product meal, cassava root flour, soybean meal, pea starch, pea protein, beef fat preserved with mixed-tocopherols, lentil flour, canola meal, dried yeast, natural liver flavor, phosphoric acid, calcium carbonate, salt, choline chloride, plus additional vitamins and minerals[a]. Or this long-established brand: whole ground corn, soybean meal, chicken by-product meal, corn gluten meal, beef tallow (preserved with mixed tocopherols), animal digest, turkey by-product meal, salmon meal, ocean fish meal, phosphoric acid, calcium carbonate, L-lysine monohydrochloride, choline chloride, salt, plus additional vitamins and minerals[b].

But dry food isn't the only source of highly processed foods and ingredients. This canned cat food was listed top overall in a recent search for the "best" cat food even though the ingredients reflect the artificial matrices of reconstituted ingredients: water, chicken, wheat gluten, meat by-products, liver, fish, soy flour, corn starch-modified, glycine, tricalcium phosphate, natural flavor, plus minerals and vitamins[c]. Where another brand lessened the impact of processing by limiting preprocessed or fractionated ingredients: turkey, turkey broth, turkey liver, peas, pea protein, canola oil, dicalcium phosphate, salt, plus vitamins and minerals[d].

Although the requirements of high levels of protein are recognized for this obligate carnivore, the levels and the types of protein continue to be debated. The foods above offer approximately 39, 36, 55, and 52 percent protein, respectively, based on dry matter. A cat's requirements for higher protein have been attributed to adaptation to a hypercarnivorous diet and subsequent loss of the ability to downregulate amino acid catabolism. Analysis of brain glucose requirements reveals that on their natural diet, the high protein requirement of the domestic cat is the result of routing of amino acids into gluconeogenesis to supply the needs of the brain and other glucose-requiring tissues (Eisert, 2011). Yet, commercial pet food formulators generally rely on carbohydrates to provide a dietary source of glucose (Laflamme et al., 2022).

The type of protein is just as critical for optimum nutrition. Reductionist nutrition accepts "protein equals protein" with adjustments in amino acids to meet the cat's unique needs. Although often referred to as interchangeable, plant protein and animal protein are not. Each provides so much more than protein and it is the wide matrix of nutrients in meats that goes beyond the specific amino acids required in

a. Purina Cat Chow Brand Dry Cat Food – Naturals Grain Free
b. Meow Mix Original Choice Dry Cat Food
c. Purina Pro Plan Complete Essentials Wet Cat Food Chicken
d. Instinct Limited Ingredient Diet Turkey Wet Cat Food

cat food formulations that can impact health. Traditionally amino acids were categorized as nutritionally essential (EAAs) or nonessential (NEAAs), depending on whether they were synthesized de novo in the body. Cats can synthesize the proteinogenic amino acids[e], and therefore these AAs are classified as nutritionally nonessential. Currently the NRC does not recommend dietary requirements of NEAAs for cats, yet compelling evidence shows cats have dietary requirements for NEAAs (Che et al., 2021). Studies have also shown other animals, such as chickens, pigs and people, have dietary requirements for at least some of the NEAAs and this may also be true for cats in particular glutamine and glycine for those with intestinal damage (Wang et al., 2017). Historically, nutritionists have only considered essential amino acids for cats, but feeding only the recommended EAAs to cats of any age will not support their maintenance needs (Che et al., 2021).

Beyond these acknowledged AAs and NEAAs, a study comparing a novel plant-based meat alternative matched to meet the nutrition label of beef showed a 90 percent difference in small molecule metabolites between the beef and the plant-based meat alternative, many of which can have important physiological and anti-inflammatory immunomodulatory roles. This is illustrated by creatine and anserine, two amino acid metabolites found in animal-sourced foods exclusively and have been shown in randomized controlled trials to provide neurocognitive production in older humans (Avgerinos et al., 2018; Masuoka et al., 2021).

The Downstream Effects

Diet not only provides needed nutrients for the body but serves as substrate for the gut microbiota shaping the composition and function, and playing a vital role in the neural, endocrine, and immune systems through the bidirectional communication network, the GBA. Critical neuroprotective microbial products include short-chain fatty acids (SCFAs), neurotransmitters, and their precursors that can influence the CNS. Collectively, metabolites influence cognition, emotion, behavior, and immunity (Homer et al., 2023). Even hormones are regulated by the gut microbiota and exert broad influences systemically (Neuman et al., 2015). Other microbes such as archaea, fungi, viruses, and parasites found in the gut also share dynamic relationships but remain unclear in the cat's microbiota (Lyu et al., 2020).

SCFAs have wide-ranging effects locally and throughout the body. The three most common SCFAs — acetate, propionate and butyrate — have multiple roles in maintaining gut barrier function, regulating host metabolism, and modulating the GBA. The production, transportation, and functioning of neurotransmitters, including excitatory such as glutamate and dopamine or inhibitory such as serotonin and γ-aminobutyric acid (GABA), and their precursors, for example phenylalanine, tyrosine, and tryptophan, are all regulated by the gut microbiota.

Most research recognizes anaerobic fermentation of fibers as the largest source of SCFAs; however, acetate, propionate and butyrate can also be produced from amino acids. And, while it is widely accepted the main role of the microbiota of the cat may be similar with other mammal species (Lyu et al., 2020), capable of fermenting a broad range of dietary fibers including prebiotics, the cat evolved to thrive on a high protein, carnivorous diet, consuming minimal plant material under natural conditions (Plantinga et al., 2011). Nor does the cat's higher intake of protein appear to cause carcinogenic effects of protein fermentation found in humans (Lyu et al., 2020). So why is it deemed a requirement for a cat, or any obligate carnivore, to need some carbohydrates to maintain a healthy microbiome instead of acknowledging the type of food needed for a healthy microbiome may be different between species and the bacteria housed by that species?

In addition, human and animal studies demonstrate that along with food composition, non-nutritive ingredients and additives commonly used in ultra processed foods act

e Alanine (Ala), asparagine (Asn), aspartic acid (Asp), glutamine (Gln), glutamic acid (Glu), proline (Pro), glycine (Gly), serine (Ser), and branched-chain amino acids (BCAAs)

as disruptors of the gut microbiome (Vissers et al., 2022). These additives interact with the intestinal barrier inducing dysbiosis, stimulating pro-inflammatory pathways, increasing epithelial permeability, and altering the mucus layer. Carrageenan, used as an emulsifier in UPFs, has been found to activate immune pathways of inflammation, alter gut microbiota composition and the thickness of the mucus barrier (Borsani et al., 2021). Guar gum, most commonly used as a thickener, adversely impacts the gut microbiota activity and the colon immune response system increasing susceptibility to inflammation (Paudel et al., 2022). Inorganic phosphates, ubiquitous to UPFs with a range of applications, such as emulsifiers (e.g., sodium phosphate), pH stabilizers (e.g., phosphoric acid), and nutritional supplements (e.g., dicalcium phosphate), can alter the gut microbiota, decrease diversity, and affect the intestinal barrier function (Oda et al., 2023). A significant number of commercial cat foods – dry, canned or raw – utilize one or more of these additives as manufacturing or nutritional components.

A recent review has looked at the alterations in the gut microbiota of cats with diet, as well as the alteration of intestinal microbiota in cats with diseases including acute diarrhea, inflammatory bowel disease, obesity, megacolon and constipation, and diabetes mellitus (Lyu et al., 2020). In clinical findings, inflammation of both the GI and the skin has been associated with abnormal repetitive behaviors, with inflammatory skin conditions found in 90 percent of cats that presented with self-induced alopecia (Siracusa, 2019). Research is needed on how alterations in the microbiota can result in local and systemic disease and how the modulation of the microbiome through diet can be used as a therapy. Even more so, how these changes affect the bidirectional communication network, the GBA. Isn't the brain part of the body?

There's More to a Cat's Diet Than Preventing Hunger

Finicky. Picky. Fussy. Difficult. The truth is the cat's taste is highly sophisticated and intimately linked with feline physiology. Their palate is only part of a unique system the cat depends on to collect and convey data regarding the hunt, catch, ingestion, digestion, and approval or disapproval of the safety, nutritional value, and satiety food. Foods are not about pleasure but fulfilling needs.

Many factors influence food selection and consumption. For the individual cat that can be evolutionary factors, natural feeding behaviors and learned feeding behaviors. Cats modify choices and consume foods to regulate their intake to achieve a target balance of protein, fat, and carbohydrates—close to the composition of natural prey (Hewson-Hughes et al., 2011). Aversion or preferences can develop when foods lack specific nutrients or are nutritionally incomplete with macronutrient balancing being the primary driver of longer-term food selection and intake.

Today's cats are far removed from hunting for their meals and fundamental natural behaviors. The act of foraging for prey may be just as vital as the nutrients. Hunting draws on all senses, releases dopamine, and creates a feeling of eager anticipation reducing boredom, anxiety and depression. Re-enacting hunting behaviors with prey-type toys and food puzzles not only encourages sensory engagements and for anxiety and inter-cat conflicts can offer rewarding and relaxing behavior (Delgado & Dantas, 2020), but incorporates exercise which reduces the body's stress hormones such as cortisol and adrenaline (Schuch et al., 2018).

Discussion – Feed the Body, Empower the Gut, Fuel the Brain

Globally, the increased physical and mental health risks associated with ultra processed foods have prompted scientists, researchers, and health advocates to begin recommending regulations to reduce the impact on the animals, humans, and the planet. For our cats, the high consumption of UPFs must be addressed for a range of physical health issues, which include overfeeding and undernourishment, adverse reactions to foods, changes in the microbiome, systemic inflammation, and ensuing mental health and behavior issues.

Recent canine research suggests there are clinical benefits acknowledging the whole food matrix and incorporating raw, fresh, and minimally processed foods reducing UPF intake. Benefits that include improved blood chemistries, lower incidence of atopic dermatitis, increased resistance to parasites, less risk of obesity, reduced risk of oxalates, significantly less gut permeability, and systemic health influences from gut microbiome changes in comparison to kibble diets (Nødtvedt et al., 2007; Hemida et al., 2020). A surprising outcome of these canine studies demonstrated that 20 percent consumption of fresh or minimally processed foods or less than 80 percent consumption of dry food during puppyhood significantly reduced the incidence of allergies as an adult (Hemida et al., 2020). Even a recent study with mice demonstrated that variations in dietary composition – grain-based versus purified ingredients – and the degree of processing, could determine immune susceptibility and survival outcomes (Cootes et al., 2022). Can these findings be used as potential directions to help diagnose and treat disorders of gastrointestinal, immune, endocrine, and behavioral syndromes in felines?

While caution must be exercised in extrapolating research from human, canine, and rodent studies and applying to cats (Verbrugghe & Bakovic, 2013), diet and food have a role not only in general health, but in mental and emotional well-being for all mammals. Modulation of multiple neurochemical pathways through the GBA (Silva et al., 2020) and specific nutrients elicit changes in the brain structure, chemistry, and physiology, leading to behavioral changes (Wurtman, 1994; Neuman et al., 2015).

We have the opportunity to implement change through the use of new food technologies, advancements in a better understanding of the microbiome and the effects of ultra processed foods, to move into a whole foods nutritional approach. Diets based on the cat's natural prey that has foraged a diverse plant ecology naturally infused with AAs, NEAAS, AA metabolites, phytonutrients, and therapeutic fatty acid compositions — diets created from whole foods to mimic the cat's natural prey — may offer comparable benefits for the body but also nourish the brain (Table 1). Foods that help reduce gastrointestinal dysbiosis and improve communication in the gut-brain axis. Foods that meet the cat's evolutionary needs. Foods that must be broken down into component nutrients and bioactive compounds to be absorbed through a synergy of mechanical, chemical, and biochemical processes and nourish their physiologic, metabolic, and cognitive needs. Foods that have the potential to optimize the physical and mental well-being of our cats (Stogdale, 2019).

Table 1 Whole Food Incorporation Strategies

Today's pet parents are seeking foods with recognizable ingredients challenging the disparity of healthful nutritional recommendations for themselves to what they are pouring in their pets' bowls. Fortunately, increasing demand for minimally processed or gently cooked pet foods are opening opportunities for innovations and encouraging increased popularity and accessibility.

Strategy	Challenges/Benefits
Innovations in feline diets should focus on engendering health in this unique creature:	• Using ever-expanding knowledge of the gut microbiome • Addressing potentially hazardous components of foods and food processing • Acknowledging the whole food matrix and health benefits
Cats are inherently neophilic – they typically enjoy new and different foods – but domestic cats can develop food fixations:	• Can imprint early on with tastes, textures, and smells • To counter, offer a variety of foods as kittens and throughout life to encourage experimentation • Choices should range in textures, proteins, and styles including raw, freeze-dried, and canned • Limited food choices and exposure to same diets can lead to less interest in experimenting • Food aversion can develop when fed under stressful or unusual conditions
Tips for new food introduction:	• Repeat the exposure to the new food at least three times to trigger interest • Make hunger (several hours without food) and play a precursor to new food introduction to mimic hunt, catch, then eat • Can be placed next to the current diet, fed separately in a new place as a treat, or in a food puzzle • Sprinkle crushed (not whole) freeze-dried toppers or extra smelly treats to entice interest
Easy 80/20 introductions based on canine studies concept:	• Must be done with complete diets to avoid a nutritional imbalance, such as 80 percent canned to 20 percent freeze-dried, or max of 10 percent treats/toppers such as fresh meat treats with 10 percent freeze-dried diet • Freeze-dried can be used as a topper or rehydrated for a small meal • Increase amount over time and/or try intro of lightly cooked or raw diets
Fresh meat as treats and to boost meat-sourced foods that may offer more bioavailable nutrients:	• Fresh raw meat or lightly cooked can help boost the many benefits discussed • Grass-fed or pasteurized enriches the phytonutrients and omega-3s, phytochemicals include terpenoids, phenols, carotenoids, and tocopherols • May be more bioavailable through animal tissue and offer a range of therapeutic benefits including cognitive function • Cooking reduces polyphenol and terpenoid contents in meat by 25 to 60 percent (Van Vliet et al., 2021) • Extrusion and drying result in greater reduction of nutrients compared to freeze-dried, stewing, or sous vide

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