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**They Eat What We Are**

**Dogs and cats are fed for our convenience and in accord with our crazes. On that, a \$15 billion business feasts.**

FREDERICK KAUFMAN

I had been told that in the basement of the animal-science laboratory building at the University of Illinois, Dr. George Fahey kept a colony of strange-looking dogs. At Fahey's orders, each of the dogs had undergone a surgical procedure to string a length of tubing from its intestinal tract to a clear plastic spout that stuck out its side. Fahey, a professor of animal and nutritional sciences, could open a spout by hand, fill a bag with whatever happened to ooze out and calculate how much the dog had digested before whatever it had not digested could move farther through its body. The plastic tubing was inserted in the ileum; the exact spot where food absorption ends and fermentation by the microflora and bacteria of the lower bowel begins. Given a large enough sample of any dog food, George Fahey could calculate how much vitamin or mineral or fat or sugar would enter a dog's bloodstream and how much would be irretrievably lost. Fahey has spent his career investigating the metabolism of domestic animals, and his research has helped define the nature of pet food. In addition to his dog colony, Fahey supervised a number of other nutrition laboratories in the university's department of animal sciences, and for the most part his workaday hardware consisted of the various contrivances necessary to measure how much food a pet might or might not digest. Thus the baroque collections of viscometers, desiccators and pulverizers, the vials brimming with dog excreta laced with acid, the racks of test tubes filled with cat urine, the containers of canine and feline gastric fluid and the retorts of dog and cat blood. The largest of his labs contained a walk-in refrigerator holding glass jars of secret-coded dog and cat diets, experimental feeds of the future that in their present states resembled nothing more than heaps of brown dust. Piled nearby were stacks and stacks of the commercial pet foods the researchers give to animals in the control groups of their experiments; brands Fahey did not want specified in this article. I had come to Urbana-Champaign to tour Fahey's nutrition laboratories and to catch a glimpse behind the scenes of the canine- and feline-nutrition business. I had geared myself up to see those plugged dogs in the basement, but first we had to spend an hour or so strolling the upper floors of offices and laboratories. As we did, Fahey outlined the evolution of the canine habitat, from the wild to the barnyard to the front yard to the front porch, then from the front porch to the living room, from the living room to the bedroom, and from the bedroom to the bed; and under the sheets. He described how, to people who live alone or couples without children, a dog or a cat becomes an object of love. And an object of love must be civilized. Civilized means different things to different people, and it does not necessarily have anything to do with a pet's nutritional requirements. Dogs can get along just fine on a daily ration of corn and soybeans. "That's about the cheapest diet you could put together," Fahey said, and it provides all the vitamins, minerals, protein, fat and carbohydrates a dog needs. But it wouldn't sell to broad segments of the modern market. "People buy diets on the basis of two things," Fahey said. "The first is palatability. You

put it on the floor and the dogs clean up the bowl." He lifted a pencil from a desk and held it in the air. The second thing, he explained, is the appearance of the stool. "It should be half as long as this pencil, picked up as easily as this pencil, Ziplocked and away we go." He added, "We have to have that if they're keeping the dog in the condo on the 34th floor and they have a white carpet." All the more so if the dog is in bed, under the sheets. The reason Fahey has spent his scientific career investigating all manner of starch, carbohydrate and fiber, the reason he has put tubes inside dogs to analyze what they have digested before they have finished digesting it -- that reason suddenly became clear: George Fahey has been confronting the myriad challenges of controlling canine bowel movements. Premium dog foods contain at least 30 percent protein and 20 percent fat, he said. "Do we need to feed that much? No. But this way, you have a total tract digestibility of 88 percent, which is good if you don't want that dog to go in your house when you're out for the day. A corn-soy diet can't do that. The dog can't hold it." For all the apparent variety -- store shelves stocked with everything from Alpo to ZiwiPeak -- pet food is a business of behemoths and bottom lines, with sales approaching \$15 billion last year. Procter & Gamble acquired Iams for more than \$2 billion in 1999, and two years later Nestle purchased Ralston Purina for \$11 billion. A single multinational, Mars Petcare, sells not only Whiskas and Pedigree but also Royal Canin, Sheba, Kitekat, Frolic, Trill, Aquarian and many other brands. In 2005, the big companies in the industry spent nearly \$300 million on advertising. With his academic status and independent financing, George Fahey's research spares pet-food manufacturers the negative publicity they might attract if they ran their own experiments on surgically altered dogs. Even so, the industry giants operate proprietary research centers, like the 60,000-square-foot facility in St. Louis where Nestle Purina scientists conduct investigations into molecular biology, immunology and aroma chemistry. But as the pet-food titans pour millions into developing and mass-producing chow, biscuits and treats, they have been challenged by manifold new marketers of high-end animal diets that pride themselves on their organic suppliers, sustainable packaging, human-food-grade ingredients and revolutionary philosophy. The recall this spring of 60 million packages of pet food contaminated with melamine from China highlighted what was already an obsessive focus on what our dogs and cats eat. In recent years, the relative merits of low-cholesterol diets, high-protein diets, low-fat diets and the BARF program of bones and raw food have generated arguments among pet-food zealots as enduring and bitter as Atkins versus Pritikin among human dieters. Web sites like BalanceIt.com offer astounding arrays of pet food recipes that mimic human cuisine and use human-grade ingredients: lasagna, spaghetti and meatballs, lamb stew. Numerous sellers offer doggy doughnuts, cannoli and even wedding cakes. In fact, the lines of human and companion-animal nutrition have been tightly interwoven ever since the domestication of the dog some 12,000 years ago. Our culinary ambitions for our pets have defined something of a utopian project, and its refinements have mirrored our own relationship with food. The increasing specialization of the pet-food industry today may well reflect not just our desire to keep our pets healthy but also our continuing urge to shape them in our own image. The first commercial dog comestible appeared soon after James Spratt, a Cincinnati electrician, traveled to London in 1860 to market lightning rods, then changed his mind and entered the business of retailing a feed inspired by his own dog's diet of discarded ship's biscuits. In the early 20th century, Chappel Brothers of Rockford, Ill., supplied canned horse meat to the hungry citizens of France, Holland and Italy -- and exported the scraps back to the United States as dog food. Chappel Brothers marketed Ken-L Ration and at its apex slaughtered more than 50,000 horses a year. But as the desire for purity and health spread to growing numbers of Americans, it influenced their hopes and dreams for their pets. In the book "The Ralston Brain Regime," a turn-of-the-century human-diet guru named Webster Edgerly presented "a

course of conduct, exercises and study designed to develop perfect health in the physical brain." The name Ralston was itself an acronym of Edgerly's seven life principles: Regime, Activity, Light, Strength, Temperation, Oxygen and Nature. One of the 800,000 -- Ralstonite -- acolytes Edgerly eventually attracted happened to be William H. Danforth, a young fitness fanatic and animal-feed entrepreneur who had begun to shovel together a mix of grain, molasses and salt that he sold under the brand name Purina, "where purity is paramount." When Danforth approached Edgerly, the diet celebrity granted Purina an endorsement from 'Dr. Ralston," and the company took on a new name. Despite the emphasis on health, food for animals has long been prone to potentially lethal adulteration. In the 1920s and '30s, industrial processing generated a number of newfangled carbohydrate byproducts that entered the food stream, and a terrible ailment known as canine hysteria began to torment dogs. "The animal behaves in a thoroughly panic-stricken manner,"; noted a report by Food and Drug Administration scientists in 1948, "throwing itself against the sides of the cage, clawing the air and howling piteously. If unconfined, it will run wildly about bumping into all objects in its path." In acute cases the disease culminated in convulsions and death, and the culprit turned out to be a chemical wheat-bleaching agent used in processing flour. Of course, there would have been no panic-stricken dogs if there had been no processed flour in their food, and no processed flour in their food if there had been no processed flour in human food. Notwithstanding such occasional defilements, research into pet food and human food continued to follow parallel paths. In 1954, a pair of Ralston Purina visionaries borrowed an extruder from the human breakfast cereal group at Purina, where the apparatus was being used to produce a variety of new breakfast cereals like Chex. The investigators cleaned out the rice flour, salt and sugar, packed the machine with emulsified livers, buttermilk, soy meal and other ingredients, mixed everything together and let the slurry dry on an asphalt lot. "It tasted similar to popcorn," one of its creators later wrote, "and dogs loved it. When the marketing meetings began, Purina executives decided that instead of distributing the product to the company's nationwide web of feed stores, this new pet food, code-named X-24, would go to supermarkets, where it could be bought and sold next to human groceries. Within four years, Purina Dog Chow had become the best-selling dry dog food in the world. The vast majority of America's 75 million dogs and 88 million cats continue to feed on scraps from the human food industry's table: pet-food ingredients like ground chicken bones, pig blood and distillers byproducts. Indeed, when an agriculture-processing company encounters an industrial leftover -- corn fiber, let's say, from its production of ethanol -- it might put in a call to George Fahey's lab. Fahey has done a great deal of work with corn fiber and is exploring its potential as a source of fiber in the canine diet. Although pet nutrition has generally followed trends in human nutrition, sometimes that order has been reversed. "We will see corn fiber in human foods like cereals and snacks," Fahey told me. "There's no reason that it should not be able to be used." Such adaptations have occurred before. In the 1980s, for instance, the experimental meals Fahey fed to the dogs in his lab sometimes included hydrogen-peroxide-treated wheat straw. A major manufacturer of baked goods for humans, he said, picked up on the idea of using hydrogen-peroxide-treated fiber and experimented with mixing the substance into some of its breads. Experiments with cats and dogs have long been used as a key to the scientific mysteries of the human diet. For obvious reasons, scientists cannot test human digestion by delivering experimental meals that lack vital nutrients. Dogs, however, have metabolism similar to ours, they are widely available and their internal organs are larger than those of rats, which makes them well suited to examination. In 1816, a French physiologist, Francois Magendie, fed groups of dogs only a single food, like sugar or olive oil. The animals died, but Magendie helped identify the dietary requirement for protein. In 1921, Edward Mellanby, a British pharmacologist, conducted an

experiment in which he raised hundreds of puppies indoors. In the total absence of sunlight, and eating nothing but oats, the dogs developed skeletal deformities associated with rickets, but Sir Mellanby laid the groundwork for the discovery of vitamin D. In fact, some of the vitamins sold at your local supermarket or health food store were discovered thanks to deficiency studies that left experimental colonies of domesticated animals emaciated or comatose. Paradoxically, the same nutrition experiments that caused disease or death have led to pioneering advances in animal health care. Because nutritional biochemists have measured almost everything about the canine and feline diets -- from energy densities to intestinal transit times -- they know what to do when something goes wrong. The latest word in digestibility studies may have cost lab animals a score of nasty symptoms, but the data gathered will help save many sick pets down the road. The William R. Pritchard Veterinary Medical Teaching Hospital at the University of California, Davis, houses what was the first therapeutic pet nutrition center in America when it opened in 2003. Today the hospital treats more than 25,000 small animals every year, and the nutrition center does much of its work on the clinical frontier where sustenance meets medication. Here, on a wall outside the Nutrition Support Service, I noted a plaque announcing that the center had been backed by money from the Nestle Purina PetCare Company and Hill's Pet Nutrition Inc. "There's virtually no national funding out of the federal government for research on the health and well-being of cats and dogs," said Bennie Osburn, the dean of the university's School of Veterinary Medicine. "We have not seen N.I.H. show interest. The U.S.D.A. has not shown interest. The federal government will provide basic funding for ornamental flowers, but not companion animals." In the hospital's hallways, white-coated doctors walked sick and bandaged pets, while weaker animals reclined on low gurneys. Inside the nutrition center, staff members were formulating individualized diets for the patients. Along one wall of the room ran a line of more than 30 clear plastic dispensers of various kibbles in every shade of ocher, and next to the standard brands of cat food sat jumbo packs of GastroENteric Feline Formula, Kidney Function Feline Formula and Diabetes Management Feline Formula. There were jars of oral electrolyte solution, milk replacers for neonates, protein supplements made from whey and synthetic diets for critically ill animals on life support. Above the provisions and extracts sat two rice steamers for those patients whose gastrointestinal upset would allow them only bland foods like white rice. In fact, human food pervaded the pet nutrition center, from Chicken of the Sea tuna to Betty Crocker's Potato Buds, not to mention Metamucil and Fibersure. "The clinical nutrition program will spread across the country," Osburn predicted. Some of his confidence was surely an administrator's pride in his university, but it didn't seem like a stretch to imagine that the nutritional products and procedures developed here -- including cancer-care diets and high-fat regimens for anorectic pets -- could soon become successful on the mass market. Dogs and cats are living longer and growing fatter and more dyspeptic, and, like their owners, they have to watch the calories. In 2003, scientists published the genome of a standard poodle named Shadow, followed two years later by the full genetic sequence of a boxer named Tasha. Today, as geneticists close in on the cat genome, researchers and pet-food marketers are rushing to find ways to make high-end pet diets even more customized. "This is part of a larger trend in nutrition: complexity and individualization," says Marion Nestle, a professor of nutrition, food studies and public health at New York University. "In the future someone is likely to do a genetic profile of your animal and prescribe accordingly. How accurate or useful this will be is an open question." Genome-based animal feed may evolve into the ultimate personalized diet for pets, or it may meet the same fate as the unsuccessful collaboration by Carnation and Upjohn in 1985 to market birth-control dog food. Professor Nestle perceives two tracks for the future feeding of America's cats and dogs, tracks that parallel the nutrition trends of

their owners: The wealthiest 5 to 8 percent of pet owners, those with college educations, annual household incomes in excess of \$70,000 and an expanding human diet of organic, locally grown and luxury food products, will provide ever better, fresher and more delicious food for their pets. The other 92 to 95 percent of pets compose a second track that will consume increasingly industrialized diets. Even today these diets commonly consist of byproducts cooked into sterile and viscous masses, sheared into the simulacrum of a bone or a patty, and then, according to a report by the National Research Council in Washington, spray-dried with minuscule beadlets of fat, protein and calibrated savor. Kind of like the industrial, increasingly synthetic and processed diets of their owners. Nestle's research for her next book, "What Pets Eat," has also brought to her attention the enormous numbers of emerging pet-food companies. ("I just met with this guy in Colorado who's doing a high-end bison pet food," she says.) As these pet-food start-ups edge their way into the market, many entrepreneurs appear to have concluded that there must be a way to feed dogs and cats without relying on the rendering industry, the surgical procedures of academic research or the detritus of alternative-fuel manufacturing. They have begun to speak of a pet-food revolution. According to Nestle, the push to reform pet food is part of the broader movement to transform the way human beings eat. The pet-food movement "is grass roots, and it is a combination of the so-called good, clean, fair movement, the slow-food movement, the locally grown movement and the farm-animal welfare movement. These social movements are about changing the industrialized food system," she says. The latest trends in pet food emphasize not only natural and organic ingredients but also an increased obligation to identify the precise origins of those ingredients. Nestle says, "This will place enormous pressure on standard industrialized pet-food companies to say where their stuff comes from." Typical of the grass-roots, slow-food, socially responsible pet-food campaign are Miya Gowdy and Vivian Outlaw, who cooked 5,000 pounds of dog food in Gowdy's TriBeCa loft last year. They simmered the stews of their Righteous Dog Food brand on a four-burner stove top that, when I visited a few months ago, sat amid Gowdy's collection of her own abstract paintings, bookshelves stocked with back issues of the Buddhist magazine Tricycle and an array of other companies' pet-food packaging that ranged from Buddy Biscuits to Chompions Super Premium Breakfast Formula. "Our artistic proclivities have made us perfectly suited to lead this revolution," Gowdy said. Her intense painter's gaze beamed from behind horn-rimmed glasses. "Artists think in process." Righteous Dog Food retails for \$7.50 a pound, compared with around \$1 a pound for an inexpensive commercial brand. Gowdy and Outlaw envision a time when they will sell 12,000 pounds of food each month in the New York metropolitan area, enough to feed 600 dogs -- and to make a profit. For now, demand has outstripped the capacity of Gowdy's General Electric range, so the partners have begun to prepare their products at an industrial kitchen called Hudson Valley Foodworks, in upstate New York. Righteous Dog Food shares the kitchen's 25,000 square feet with 40 other food companies, among them the makers of Hot Dog Charlie's Chili Meat Sauce and Spacey Tracy's Sweet Sunshine Pickles. A company manufacturing dog biscuits, which, like Righteous Dog Food, only uses human-grade ingredients, has also joined the roster. On the sweltering morning the partners invited me to visit their operation, Gowdy and Outlaw planned on cooking two 500-pound batches of a chicken recipe and one 500-pound batch of beef-based fare. Eight cooks in clear plastic gloves and hairnets met them when the partners walked into the plant at 8:30. The crew members cored apples, chopped parsnips and chattered in Spanish while one of them fiddled with a CD remote wrapped in cellophane. Soon, the sweet chords of ranchera music joined the whirring, the grinding and the sudden bangs and crashes. In the back of the kitchen stood two massive stainless-steel steam kettles of seething ingredients hooked up to a byzantine arrangement of pipes, pressure valves and a variable-speed transmission. Sweat

dripped down the outside of each 150-gallon kettle, while inside revolved the 14 teeth of the mixing blade. Unlike standard industrial pet-food operations, the cooking processes of Righteous Dog Food involved no gelatinizing, no solubilizations, no extrusion and no spray coating. Nor did Righteous Dog Food rely on computerized spreadsheets to measure its ingredients. On a table next to a steam kettle sat a handwritten production chart: Take 24 quarts of chicken broth and add carrots and garlic (mix 10 minutes); add potatoes and yams (mix 15 minutes); add rosemary and apples, then pour in the bone meal and the raw eggs, the certified organic alfalfa, the red rose hips and the nettles, the safflower and salmon oils, the barley and the chicken meat, the burdock and the parsley, the dandelion greens, the cilantro and the liquefied beef hearts. A heavyset production manager named Mike Perez stood next to the tanks and checked items off the ingredient list. A former truck driver from Brooklyn, Perez went into the commercial baking business in 2000, when he joined a friend who was producing a line of cookies, brownies, blondies and biscotti. "And now dog food," he said. He beamed a searchlight into a steam kettle. "I never thought I'd be cooking dog food." Perez poked a stainless-steel shovel into the simmering mixture and extracted some tidbits. Gowdy crushed the vegetables with her fingers and popped the gray mass into her mouth. She chewed, nodded, smiled and invited the rest of us to try it. Perez ripped open a 50-pound bag of organic rolled oats and shook his head. "It's probably too healthy for me," he said. If you are what you eat, is it also true that you are what your pet eats? Tim Phillips, the editor of Petfood Industry magazine, says that animal owners tend to think so, and even more often they tend to think, This is what I like, so my dog or cat must like the same things. If a cat owner wants takeout, her cat can have takeout, too; if she watches TV while she dines, her cat can have its own TV dinner. Vegetarians offer their animals vegetarian meals, and if you happen to be allergic to beef, perhaps your pet should eat only kibble based on protein from rabbit, venison or kangaroo. Observant Jewish pet owners may select Evanger's Super Premium Gold Dinners, which have been certified kosher by the Chicago Rabbinical Council. The dogs and cats of athletes crunch energy bars. "It's a quasi religion," Phillips says. Whether religion, science or business, pet food is booming. Today about a third of the animal-science graduate students studying at the University of Illinois with George Fahey and other professors devote themselves to nutrition, and according to Fahey the industry brims with job opportunities for them. "It's as good a time as ever in the 30 years I've been doing this," he told me. As we neared the end of Fahey's tour of the laboratories at Urbana-Champaign, I wasn't exactly eager to see the animals in the basement that had been mutilated for the sake of science -- however much their surgically attached plugs may have contributed to the research Fahey and his colleagues had published on the digestibility of beet pulp and citrus pulp, potato starch and wood cellulose. But there seemed to be little choice. "Let's go out and see the dogs," he said. When we came to the Authorized Access sign, the professor swept his electronic pass card over a pad, and the metal door swung open. "This is a very secure building," he said. Accompanied by one of his lab technicians, we passed a set of bright red cattle gates, then continued down a long corridor of pink portals, behind which resided colonies of rats, rabbits, hens, swine and cats. We passed a disease quarantine room and a chamber marked Surgery. Fahey stopped at a green door. Another swipe of the pass card and we stood before seven immaculate kennels, each of which held a short-haired, mixed-breed hound. From the side of each hound emerged a clear, plastic spout. "Hello, girls," Fahey said. They looked at him with calm, bright eyes and wagged their tails. Wiggles came up to us and sniffed my fingers. She had a wet nose and sleek white fur. Above her black-barred kennel hung a plastic clipboard marked with a number, courtesy of the U.S.D.A. "We get inspected," Fahey said. Wiggles's sign read: **USDA #348643**

Canine, Hound Mix, Female DOB 8/25/00 Received 8/28/01 Butler Farms Dr. Fahey Protocol 06222 Protocol 06222 turned out to be a test of something called an oligosaccharide. Fahey would not reveal the precise origin and nature of this particular carbohydrate, but given his record it was possible to imagine that the mystery molecule might one day turn up in Iams dog food, or perhaps your seven-grain bread. We inspected Wiggles's cage, then the cages of Bo, Teeny, Dutchess, Flick, Shai and Todd. Every floor sparkled, every stainless-steel feed bowl shone. The hounds were gentle and sociable, Fahey said, "ideal animals to work with." The dogs appeared content within their temperature-controlled environment, where the lights go on at 6 every morning and off at 8 every evening, where regulated supplies of air enter and exit the ventilation system, where they can play with their toys and listen to AM radio all day. Fahey said that the kennels exceeded federal guidelines for size and that the lab assistants took the dogs outside twice a week to exercise, romp and catch some rays. "If you had this much money spent on you, you'd be happy, too," he said. "They're spoiled brats," the lab technician said. Of course, the installation of plastic plumbing into a living hound did not seem much like spoiling. And in fact there was another way -- a more precise way -- to determine how much energy a dog or a cat had acquired from its food. Unfortunately, it turned out to be a research method called "total carcass analysis," which, as the name implies, required the animal to be dead. "You need to have a darned good reason to do a terminal case," Fahey said to me earlier. "It's too expensive." And it is not for the squeamish. "It's a helluva job," he said. "You have to grind, you have to sieve, you have to grind again. It's a good technique, but it's very labor-intensive." I cringed. Now Fahey pointed to the spout sticking out of Wiggles's side. "There," he said. "You see the cannula" The plugs did not seem to irritate the dogs. "If it is put in correctly, it becomes part of them," he said. "It heals very nicely, and becomes a part of their anatomy." The ports must be opened and inspected at least once a week and flushed at least once a month, and when Fahey or his colleagues collect samples they simply unplug a stopper, attach a plastic bag and let the dogs run around, which pushes out the digesta. As Fahey described the lab's procedures, the room grew quiet, and by the end of his monologue the dogs sat in total silence, their eyes plaintive. Clearly, they were begging, but begging for what? Perhaps they expected to be fed. Perhaps they longed for an end to their captivity. Fahey grinned and said nothing, but the moment we left the room and shut the green metal door, it sounded as if some evil doctor had begun to torture the poor animals. They howled and blubbered and brayed and whined, and their pathetic ululations followed us as we traced our way back down the yellow cinder-block hallway, past the cattle gates, through the final door and out to the light of a hot Midwestern afternoon. "What made them so upset?" I asked. "They thought you were going to take them out to play," Fahey said. "Look what you did."

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