Feeding Raw Diets to Pets: Where are we Now?

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Raw meat diets have been on the market for many decades and used by zoos, mink farms, dog racing facilities, and other professional establishments. In the last 20 yrs or so, pet owners have been feeding raw meat. However, after ten yrs the percentage remains relatively low (2%).

Type of food purchased in past 12 months?
Source: APPA National Pet Owners Survey 2011-2012

Source	Dog owners (% of 544)	Cat owners (% of 483)
Labeled premium	44	35
Complete & balanced	28	31
Human / homemade	21	15
Labeled natural	13	11
+ nutraceutical	8	4
+ pre or probiotics	4	5
Labeled organic	6	4
+ herbs, botanicals	3	8
Raw	2	2
Vegetarian	1	2

Why discuss this topic?
There are still two health issues concerning pet owners and veterinarians:

1. Nutritional integrity
2. Food safety

Nutritional integrity
The raw food diet has several names but can be grouped by source:

- Homemade
  - Usually not complete or balanced (Streiff et al 2002)
  - can be done but should be checked by nutritionist
- Commercial –sold as
  - 'Complete and Balanced' - very few still
  - 'Supplemental or Intermittent feeding' - most

Complete - diet contains all of the nutrients known to prevent a deficiency and be essential for life.

- "Complete" - There are 36 essential nutrients for the dog and 38 for the cat.
- "Balanced" - Diet has nutrient concentrations in proportion to the energy density of the whole diet.

Most common nutrients missing are

- Vitamins - Bs, A, D and E - Unless some organ meats are included but then high energy
- Minerals - zinc, copper, iron, selenium
- Most often out of balance because the recipe contains high fat (calories) which came in with the meat or organs. Essential nutrients are deficient energy (g/ kcal) basis

Good news – homemade recipes are easily reformulated to be complete & balanced

- Add vitamin mineral mix
  - A few good ones are now available from nutritionists (2% of recipe)
  - OTC pet vitamin mineral products will not work, i.e., "Pet Tabs" will not complete a HMD
- Add calcium (w/o phos) source
  - Bone meal will not complete the HMD
  - Finding human calcium source w/o Vit D is a problem
- Balance - Caloric density can be adjusted by lowering fat intake – use leaner meat or Increase percent of the vitamin mineral supplement

Essential nutrient	350 kcal/g	450 kcal/g	500 kcal/g	HMD recipe
Copper (mg)	0.73	0.94	1.04	0.5 (deficient)
Iron (mg)	8	10	11	102 (x9)
Zinc (mg)	12	15	17	11 (deficient)

Nutrition: commercial raw diets - should say on the package

- "Complete and balanced according to ….."
  - More products are making this claim compared to 10 yrs ago but
  - Based on Lab analysis – not feeding trials
- "For supplemental or intermittent feeding only" - Owner must read the package
  - Examples:
    - Chicken Gizzards & Hearts $3.30/lb
    - Ground Chicken Necks $4.47/lb
    - Beef Ground $14.60/lb
    - Chicken Frames Mrkt $

- These product can be made into complete and balanced recipes

No Nutritional Advantage … to feeding raw vs. cooked. The claim is for 'yet to be determined' nutrients. Analysis of known essential nutrients when comparing a cut of meat cooked vs. raw vs. rare after adjusted for water content is in significant. USDA National Nutrient Database for Standard Reference.
Food safety.

Nutrient	Unit	Raw DM	Cook DM	Cook- Raw Diff	30 lb dog daily need	% AAFCO Requirement
Energy	kcal	593	584	-9	600	-2
Protein	g	60	65	5	31	16
Total lipid (fat)	g	37	34	-3	9	-39
Carbohydrate	g	0	0	0	0	0
Fiber, total dietary	g	0	0	0	0	0
Sugars, total	g	0	0	0	0	0
Calcium, Ca	mg	71	48	-23	1020	-2
Iron, Fe	mg	4.4	4.2	-0.2	14	-2
Magnesium, Mg	mg	62	53	-9	68	-13
Phosphorus, P	mg	551	502	-50	850	-6
Potassium, K	mg	929	807	-122	1020	-12
Sodium, Na	mg	153	134	-19	102	-18
Zinc, Zn	mg	10	12	1	20	6
Copper, Cu	mg	0.2	0.2	0.0	1	-1
Manganese, Mn	mg	0.03	0.02	-0.01	1	-1
Selenium, Se	ug	68	70	3	19	14
Thiamin	mg	0.2	0.2	-0.01	0.2	-6
Riboflavin	mg	0.3	0.3	0.02	0.4	6
Niacin	mg	18	17	-0.4	2	-22
Vitamin B-6	mg	2	1	-0.3	0.2	-164
Folate, DFE	ug	32	19	-13	31	-43
Vitamin B-12	µg	3	4	1	4	19
Vitamin A	IU	0	0	0	850	0
Vitamin E	mg	1	1	0	9	0
Vitamin D	IU	0	0	0	85	1

Food safety

U.S. meat, poultry and egg supply is contaminated with micro-organisms. Meat from healthy animals becomes contaminated between slaughter and display case. A notable difference from the "fresh kill" raw meat consumed by feral omnivores and carnivores.

In 2011, one third of the ground chicken sold for human consumption tested positive for Salmonella.

Grade A eggs are contaminated with salmonella. Salmonella enteritidis infects the ovaries of healthy appearing hens and contaminates the eggs before the shells are formed.

Clarification: USDA meat inspection - Under the Federal Meat Inspection Act,

- All meat and poultry products for human consumption and interstate commerce are subject to mandatory USDA inspection.
- There is no nutritional advantage to feeding "100% USDA inspected" ingredients from a "USDA-inspected facility"
  - Not a nutritional assessment
  - Ingredients are not USDA "approved".
- Meat Inspectors are Civil Service employees
  - Federal government bares the cost of inspectors
  - Inspectors are independent of the plant management.

Clarification

USDA grades of meat - graded by the USDA based on yield, palatability & other economically important traits (appearance, fat content, edible proportions, etc).

- There is no "human grade"
- "using only the finest whole food 100% human quality ingredients!" = fit for human consumption

Consumer awareness

FDA had presumed purchasers of raw meat were aware of the potential risk and could take measures to mitigate those risks. However, pet owners who may not be as aware of the potential for harm feeding raw meat diets to companion animals has raised concerns.

Study (Weese et al 2005)

Twenty-five samples commercially available raw meat pet diets (chicken, beef, lamb, game, salmon): 13 canine, 8 cat and 4 did not indicate. Obtained from the common marketplace from 8 manufacturers. Cultured for total coliforms, E. coli, Salmonella, Campylobacter, Clostridium and Staphylococcus aureus. Results :

- 20% samples + for S. typhimurium
- 20% samples + for Clost. Perfringens.
- Clost. difficile toxins A and B from the one turkey diet
- 100% samples cultured positive for coliforms - 64% positive of E. coli

Raw meat diets prepared by pet owners fed to dogs and cats have been documented to contain pathogenic:

- Y enterocolitica 4/O:3 (Fredriksson-Ahomaa et al 2001)
- Salmonella spp (Cusack et al 2002)
- E coli O157:H7 (Freeman and Michel 2001)

So FDA Issues Final Guidance on Raw Meat for Animals May 20, 2004.
http://www.fda.gov/AnimalVeterinary/NewsEvents/CVMUpdates/ucm048439.htm.

Zoonotic concerns

- Dogs and cats fed contaminated raw meat diets shed viable organisms in their feces. The presence of Salmonella spp. was isolated from 80% of the "BARF" diet samples and in 30% of the stool samples from dogs consuming those diets. (Cusack et al 2002)
- Sled dogs have been shown to subclinical shedders of Salmonella spp while eating a contaminated diet. (Cantor et al 1997).

- Serovars of Campylobacter isolated from the diarrhea of dogs was the same as that isolated from the poultry carcasses fed to the dogs. (Varga et al 1997).
- Campylobacter infected dogs excrete organisms in their feces yet can remain clinically normal. Hald et al 1997)

Food borne organisms can pass between pets and people - Case examples

- Salmonella virchow was isolated from a 4-month-old boy with chronic diarrhea. Two of 3 pets dogs had same organism isolated from their stools. Antibiotic sensitivity and PFGE pattern of the isolate from the infant was identical to those obtained from the dogs.(Sato et al 2000)
- Household transmission of food borne pathogenic organisms (Y entercolitica) from dogs to people has been documented. (Gutman et al 1973)

Precautions

- Veterinarians are trained in zoonotic diseases and have a responsibility to inform clients who want to feed a raw meat or egg diet of the potential health dangers.
- Human infections of food borne pathogenic organisms may occur when handling contaminated meat and egg products intended for pets (bones, pig ears and treats).
- Individuals who clean the cat's litter box or pick up dog's stool should exercise caution.
- Extra precautions in households where other members:
    - have an immune suppressive disease (HIV, FeLv or FIV)
    - undergoing chemotherapy, or
    - using anti-inflammatory medications
- Additional caution should be emphasized when there are young children in the household as food/fecal-oral contamination is possible.
- Food safety practices when handling the food, feeding dish and feces should be emphasized and the need for good personal hygiene reinforced. Recommend daily cleaning with a 10% bleach solution

Caution in your recommendations

- Veterinarians who recommend the feeding of raw meat or eggs without giving full disclosure of the risks and precautions may face serious legal ramifications. (Jack 1997)
- Salmonella, E. coli and Campylobacter infections in people are notifiable diseases (physicians and health laboratories are required to report cases) to local health departments in accordance with procedures established by each State.

Food borne infections do cause illness in pets similar to people.

- FDA. Bad Bug Book at http://vm.cfsan.fda.gov
- Strombeck's Small Animal Gastroenterology 3rd ed 1996
- Ettinger's Internal Veterinary Medicine 6th ed 2005

Pets do die ….

Two cats diagnosed with Salmonella gastroenteritis and septicemia. Both cats resided in the same household and were fed a home-prepared, raw meat-based diet. Salmonella was isolated from multiple organs in both cats at necropsy. Sub typing of the bacterial isolates yielded S. newport from one cat and from the diet it had been fed. (Stiver et al JAAHA 2003;39[6]:538-542.)

Dogs and cats infected with an effective dose of food-borne pathogens do have gastrointestinal signs similar to people. There are many different subspecies of bacteria with varying degrees of pathogenicity.

The severity of clinical signs is related to the dose of microbes or toxin ingested, and the condition of the host.

A family pet presented to a veterinarian for intermittent episodes of vomiting or diarrhea would initially be treated symptomatically. Bacterial culture and identification are rarely done. Most cases of food poisoning in the family pet are not diagnosed and go unreported due to a low level of suspicion and financial restraints. And could be an unrecognized source of infection to family members and other pets.

Polymerase chain reaction (PCR) amplification and identification of a pathogenic organism is not within the reach of veterinary practitioners or owners financial commitments. Hence, it is highly unlikely that local veterinary practitioners are going to make a specific diagnosis of food poisoning, identify the organism and then the food source as seen in published case reports.

Consensus statements: (Freeman et al 2013)

- AAHA - Raw Protein Diet: www.aaha.org/professional/resources. Endorsed by The American Association of Feline Practitioners and the National Association of State Public Health Veterinarians.
- AVMA - Raw or Undercooked Animal-Source Protein in Cat and Dog Diets: www.avma.org/KB/Policies
- CVMA - Policy on Raw or Undercooked Animal-Source Protein in Cat and Dog Diets: www.CVMA.net.

Conclusions

- There is an increased risk of food poisoning when feeding raw meat and eggs.
    - Could suggest rare instead of raw meat - greatest risk of disease is on the surface.

- There is no nutritional benefit to feeding raw meat and eggs – why take the risk?
- Feeding cooked food may increase food digestibility but will increase food safety.
- State precautions in your recommendations - document that in medical record.

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