

FEEDING DOGS FOR REPRODUCTION AND GROWTH

Dog Owners and Breeders Symposium

University of Florida

College of Veterinary Medicine

July 29, 2000

Richard Hill, MA VetMB PhD DipCVIM MRCVS

Waltham Assistant Professor of Clinical Nutrition

TYPES OF PET FOOD

1. **Dry food** contains very little moisture so as fed analysis reported one bag is similar to dry matter analysis. They are formed by an extruder and are **mostly low fat** ($\approx 25\%$ energy as fat) because the extruder requires a low fat mixture. These are fine for dogs that are couch potatoes but may not contain enough fat for gestation, lactation or growth, or for dogs that undertake a lot of exercise. They **may not give optimum coat quality**. More expensive dry diets have fat sprayed on after extrusion and tend to contain more fat (40% energy as fat). They are packaged in special greaseproof bags and are greasy to the touch.
2. **Canned foods** contain 75% moisture and are more expensive but usually contain more fat and protein. Multiply the analysis on the bag by four to compare with a dry diet.
3. **Soft-moist** and **Soft-dry** e.g. Kibbles and Bits. These are intermediate but mostly low fat.

DIFFERENCES BETWEEN PET FOODS

Foods with different names do not necessarily differ in composition. Marketing strategies aim to increase market share often by increasing the number of brands and increasing shelf space.

Differences between pet foods are often small because new brand names are created with small changes in composition as a method of increasing the number of brands and because the final composition is restricted by the nutrient requirements of the animal, the need to restrict cost and to maintain palatability. Some terms such as 'premium' and 'super-premium' have no definition and do not guarantee better performance. The major differences are:

1. **Dry vs. canned:** Canned usually contains more fat and protein than dry diets.
2. **Generic vs. proprietary:** Generic diets are usually made with poorer quality ingredients and are not necessarily tested on animals. Proprietary (popular and premium) brands are made with better ingredients and are usually tested on animals. "Generic" diets are inexpensive private label of local or regional manufacturer. There is no policing of label claims if only sold within the state of Florida.
3. **Life stage and therapeutic diets:** These sometimes have different compositions but diets for puppies and diets for adult maintenance are often very similar in composition.

Supplements and treats:

1. These unbalanced diets should be avoided or restricted to less than 10% of the diet.
2. Chews: may be beneficial for dental hygiene

Human food

1. Not complete and balanced so must have supplements such as vitamins and minerals added if more than 10% of the diet.
2. Uncooked meat represents a likely source of infection especially in young and pregnant animals.
3. Bones, especially spiky bones such as the vertebrae found in chicken necks can get lodged in the esophagus especially in small breeds of dog. Too many bones can also cause constipation.

Neutraceuticals and Herbs: Quality, consistency, absorption, potency and efficacy are uncertain.

A toxicity and therapeutic index has not been established. These present more of a risk in young and pregnant animals. Nevertheless, it is likely that some of these will prove beneficial in the future.

Recommendation:

1. **Feed a national brand pet food that has been tested using AAFCO approved feeding and is complete and balanced for the particular life stage (e.g. reproduction, growth or adult maintenance).**
2. **Do not feed supplements. A pet food that is complete and balanced does not require supplements. Do not feed extra meat, calcium or vitamin supplements especially in growing or pregnant animals.**
3. **Treats are okay but try to keep to a minimum. The bulk of an animal's diet should come from pet food.**
4. **If feeding mostly human food, make sure it is cooked and balanced for the particular life stage.**
5. **Coat quality can be poor if dogs are fed a low fat inexpensive dry food. To improve fat content of the diet, do not add meat to the diet. It is safer to use a more expensive high fat dry diet or to add a canned diet to the dry diet. High fat is here defined as greater than 40% energy which is equivalent on the label to greater than 5% fat for a canned diets, greater than 13% fat in a semi-moist diet and greater than 18% fat in a dry diet.**

How much to feed?

Adjust food intake to maintain optimum body weight and condition. Do not feed too much. The slim-line model is best. *Ribs should be felt but not seen. There should be a waist visible from the side and from above.* The recommendation on the back of the packet can

provide a guide but there is much individual variation. Reproductive performance may be suboptimal if animals are too fat or thin.

PREGNANCY (9 Weeks)

1. First 5-6 weeks: The bitch should maintain an ideal body condition score during mating and early pregnancy. There is no need for increased food intake above normal. Reasons for unsuccessful mating are usually poor timing, not diet.
2. Last 3-4 weeks: The most fetal growth occurs during the last trimester so increase the food intake by 10-15 percent/week. Protein requirements are high during this period so do not feed a low protein food. A higher fat high protein canned diet can be added to the usual dry diet. Growth diets or diets designed for all life stages are suitable. Diets designed for adult maintenance and therapeutic diets do not always contain enough protein. **Do not feed supplements.** The only exception would be to add folate to the diet of Bulldogs or Rhodesian Ridgebacks. There is plenty of folate in pet foods so supplementation may minimize the risk of spinal defects in breeds where these defects are more common.
3. At the end of pregnancy: Body weight should have increased 10-15%, and intake should be 40-50% more than usual. The gravid uterus often limits intake, however, so feed energy dense (high fat) food in small frequent meals. Most of the additional extra body weight should then be lost when she gives birth.

Eclampsia: Hypocalcemia is observed occasionally in dogs **around parturition** leading to tetanus, seizures and poor uterine contraction. The cause has not been established. Nevertheless, it seems wise to follow similar practices as those used to prevent milk fever in cattle (e.g. calcium supplements should not be given before parturition as it will reduce the ability of the body to respond to the calcium requirements of parturition). **This is an emergency. Treatment consists of slow intravenous administration of 10% calcium gluconate** and limiting pups suckling (raise pups with milk replacer to minimize milk needs).

Lactation: Food intake increases with milk production to a peak 3-4 weeks after whelping. Water intake increases proportionately so free access to water is essential. Amount of increase varies with the size of the litter to as much as three or four times normal. Frequent meals of an energy dense (high fat) high protein food is recommended. Diets should also contain some carbohydrate for optimum lactose production.

Bitches milk is best!

1. Colostrum contains antibodies so you must ensure that pups get colostrum or a severe risk of overwhelming infection may occur.
2. Bitch's milk is twice the energy density and contains more protein, fat, calcium and less lactose than cow's milk.
3. Breast milk varies in composition during lactation (early milk contains almost no lactose). The enzymes and transporters in the puppy intestine which digest and absorb nutrients like lactose are switched on and off in a programmed fashion, so diarrhea and/or constipation are possible if milk replacer or pet food is different from that expected by the pup at any particular age.

4. Milk also contains other substances such as epidermal growth factor that may influence the development of the puppy intestine.

Orphan Rearing:

1. Feed with warm milk replacer e.g. (Esbilac or using home-made recipe):

Cow's Milk	½ cup
Egg Yolk	2
Centrum Junior	0.5 tablet
Dicalcium phosphate	1 teaspoon
2. Volume per day is about 15% of body weight during first week then 25% during subsequent weeks assuming the food contains approximately 1 kcal/mL.
3. Monitor body weight daily. Puppies must not lose weight.
4. Keep pups warm and humid (85-90°F, greater than 50% humidity).
5. Establish feeding frequency from pups crying. Do not wake to feed. Feed often first day (every 2-4 hours) and then can reduce to four times daily and can leave overnight if kept warm.
6. Stimulate to defecate and urinate after feeding.
7. If possible foster pups on another bitch. Alternatively, divide litter in two and alternate during day between bitch and orphan feeding.

Neonatal feeding:

1. Day 1-3: suckle 40 x daily for total 10-15 hrs/day
2. Day 4: suckling more efficient so only 8 hrs/day
3. Day 10-12: eyes open, start to examine solid food
4. Week 3: offer moist palatable energy dense food 4 x daily. Remove any left after an hour.
5. Gradually increase time away from dam and then wean at 7-8 weeks of age. Reduce bitches food for two days prior to weaning to cut milk production

GROWTH

1. **Energy requirements:** From 3-4 months on, feed about the same amount of food as that required for maintenance by parents. The amount of food required by Great Dane pups and adults is greater than that required by other breeds of similar weight.
2. **Rate of growth**
 - a. Very variable depending on size. Larger breeds take longer to reach adult weight
 - i. Yorkies = eight months
 - ii. Newfoundland = 18 months to two years
 - b. Limit rate of growth in large breeds to minimize hip dysplasia and growth deformities. Keep dogs lean. Restricted intake does not affect final height, length, and bone size or muscle mass.
3. **Puppy food composition**
 - a. Feed an increased **protein** and increased fat growth diet up to 4-6 months of age. "Large breed dog diets" contain less fat to limit the rate of growth. There is currently no

evidence that these diets cause less orthopedic problems than higher fat diets if intake is restricted to prevent rapid weight gain.

- b. **Calcium should be close to 1%DM (mg/kcal) with a Calcium Phosphorous ratio of 1:1 to 2:1.** Pups fed all meat diets and insufficient calcium develops osteoporosis and pathological fractures. Large breed dogs fed too much calcium can develop osteochondritis dessicans. Most commercial puppy foods including those marketed for large breeds contain this amount of calcium. The calcium content in adult maintenance diets are sometimes closer or above 2% DM. The amount of protein has no effect on orthopedic problems.
- c. Do not feed supplements especially in large breed dogs. Large dogs eat more food so eat more vitamins and minerals. Increased calcium and vitamin D may be detrimental.