



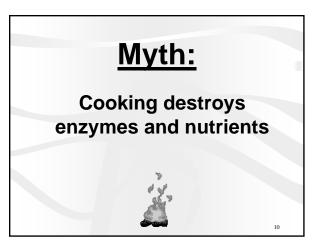
#### Cook any meat offered as a treat

# Myth:

Feeding raw meat and bones results in better skin and hair coat, and has more energy

# **Facts:**

- Protein and fat are important nutrients for skin and hair coat and energy
- Complete & balanced diets according to AAFCO procedures contribute to lustrous coat and healthy skin



# Facts:

- Cooking is beneficial:
  - Improves the bioavailability of nutrients

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- Alters structure of amino acids
- Breaks down non-nutritional factors
  - · To increase digestibility
- Kills bacteria and parasites

# **Facts:**

- · Dogs and cats make enzymes needed to digest food and use nutrients
- Manufacturers of high quality pet foods build safety margins into formulations

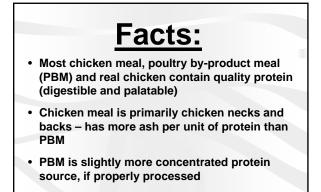
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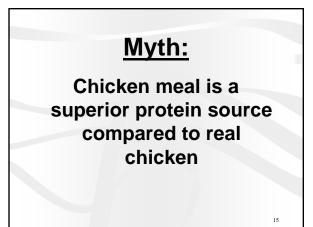
- Account for losses during normal processing and storage

# Myth:

Chicken meal is superior to poultry by-product meal and real chicken

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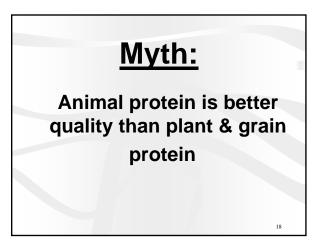


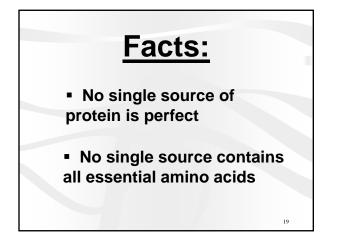
# Facts:

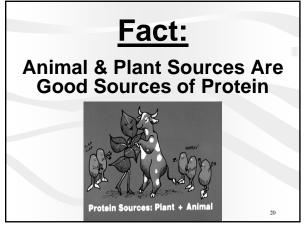
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- Chicken meal is primarily chicken necks and backs – has more ash per unit of protein compared to real chicken
- Real chicken is derived from striated muscle of chickens

Ingredient	<u>% Protein</u>
Poultry by-product meal	65-70
Meat & bone meal	50-55
Chicken meal	63-67
Chicken	60+
Lamb meal	48-55
Fish meal	60-65
Soybean meal	46-50
Corn gluten meal	60-64
Rice gluten meal	40-50
Dried egg product	<b>43-48</b> <sup>17</sup>







# **Protein Quality**

• High quality = smaller portions required

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(high quality = high content and digestibility)

Amino acid composition

- Complementary proteins
  - provide limiting amino acids
    - soybean meal is low in methionine
    - chicken is high in methionine

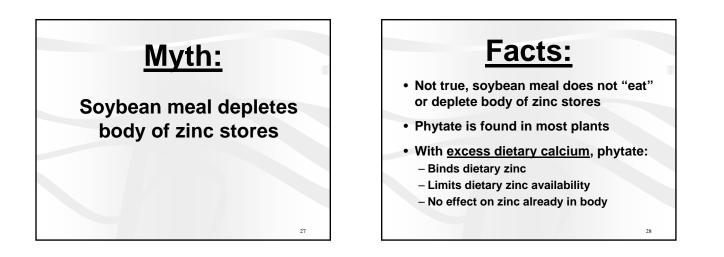
#### **Quality Protein Ingredients**

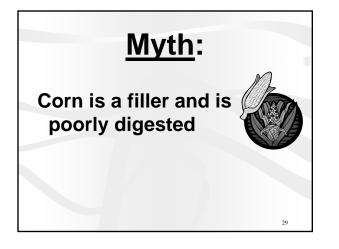
Egg (dried) Whey Corn gluten meal Lamb / Lamb meal Chicken / Chicken meal Soybean meal Pea protein Poultry by-product meal Casein Liver Beef / Beef meal Pork Salmon Wheat germ Trout Duck

Ingredient	Protein (%)	Source of:	BV	Other
Dried Egg	45-49	High quality	94	Almost complete protein
Soybean Meal	48	High in tryptophan, lysine	73	Complements meat sources
Chicken meal/poultry by-product meal	58	High lysine, methionine		Minerals vary
Beef, lamb, pork, chicken	29	Good source, low in tryptophan	74	Fat variable

Ingredient	Protein (%)	Source of	вv	Other
Fish meal	59	High tryptophan, lysine, methionine		
Corn gluten meal	60	High tryptophan, lysine		Complements meat sources
Corn (whole)	8	Low tryptophan, lysine, methionine	59	
Rice	7	Adequate source	64	Low minerals
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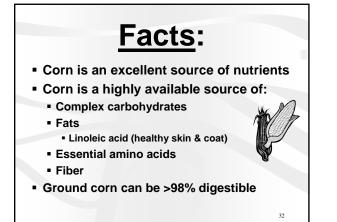


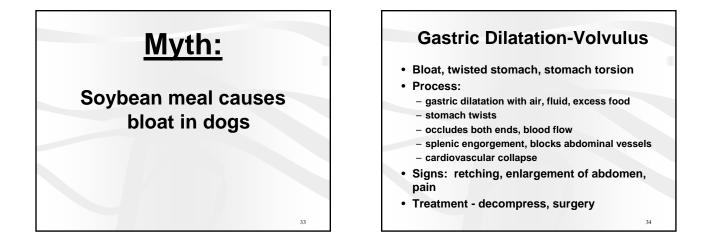


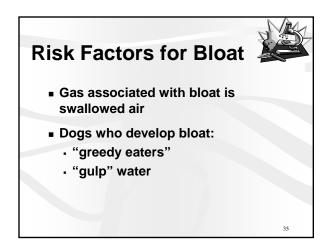
- "Fillers" have no nutritional or functional value
- Corn is <u>finely ground</u> to help ensure digestibility
- Each ingredient in product helps to achieve specific nutritional, functional, or palatability goals
- Products are tested to ensure digestibility in dog or cat
- Corn is not a "filler"

#### 5 Grades of Corn...

- USDA official standards for grain
- Dictated by pounds (bushel wt), damaged kernels (heat or broken), foreign materials (other grains, weed seeds, debris)
- #1 highest quality, #5 lowest quality
- #1 grade is generally for human consumption
- Pet food uses #2 grade corn in formulas
   USDA #2 or better grade yellow dent corn









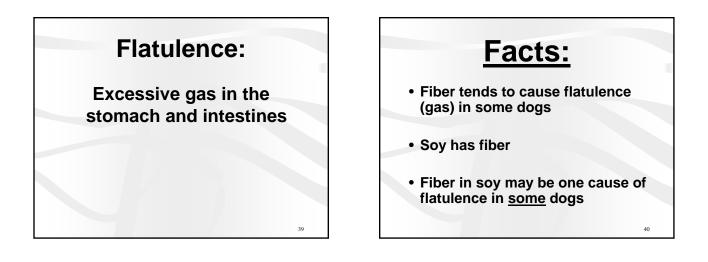
#### Precautionary strategies for bloat

- Feed several smaller meals per day
- High water content (*i.e.*, gravy)
- Easily digestible diet
- Restrict exercise before and after meals
- Know signs of bloat and what to do
- Know the phone number of nearest vet clinic

# **Soybean Facts:**

- No association between soybean meal consumption & bloat
- Dogs on meat-based diets just as likely as dogs on soy-based diets to develop condition leading to bloat

[Cornell College of Vet. Medicine Newsletter, 1991]







- Small firm stools are not a direct measure of digestibility of pet food
- Many factors influence stool size: – Type & level of fiber
  - Physical nature of diet, etc.
- Properly cooked & processed pet foods containing soy products:

- Highly digestible
- Produce firm stools

## More on loose stools

- · Puppies / kittens frequently have loose stools - No cause and effect with high-quality puppy or kitten food containing soy has been established
- Other contributing factors:
  - Sudden diet changes
  - Spoiled food (garbage, etc)
  - Rich or spicy foods
  - Lactose intolerance
  - Other food allergies not related to soy
  - GI parasites



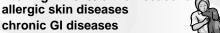
# **Clinical Significance**

In dogs:

- 1 in 400 have a food allergy
- 15% suffer from an allergic disease - atopy, contact allergy, flea bite, food
- Food hypersensitivity may contribute to:

chronic GI diseases

- "itching" in 62% of non-seasonal



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- 10 studies- 253 dogs
  - Skin surface lesions associated with food allergy
  - Beef, dairy products & wheat account for 65% of all reported cases of food allergies
  - Chicken, eggs, lamb & soy account for 25% of all reported cases of food allergies

Roudebush, Guilford, Shanley (2000) Adverse Reactions to Food. Small Animal Clinical Nutrition (4th ed.)

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# **Clinical Significance**

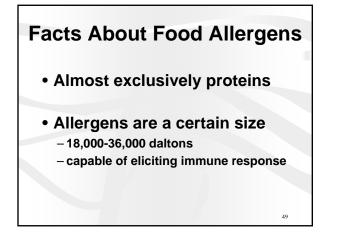
• In cats:

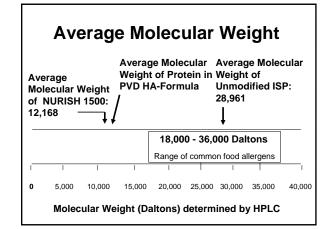
- 6% chronic skin abnormalities from food sensitivity (university practice)
- Food sensitivity 2<sup>nd</sup> most common cause of allergic dermatitis
  - Up to 11% of cats with skin surface lesion dermatitis

Cat Dermatology Study

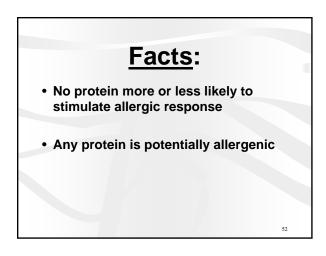
- 8 studies or case reports
  - 45 cats with skin surface lesions associated with food allergy
  - -80+% of food allergies to beef, dairy products or fish

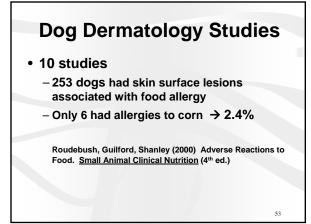
Roudebush, Guilford, Shanley (2000) Adverse Reactions to Food. Small Animal Clinical Nutrition (4th ed.)

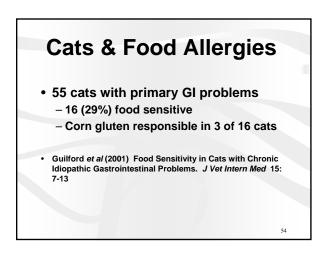


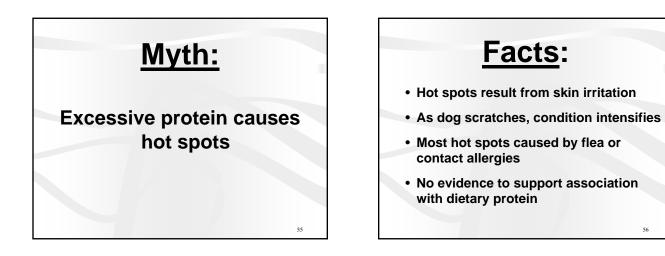


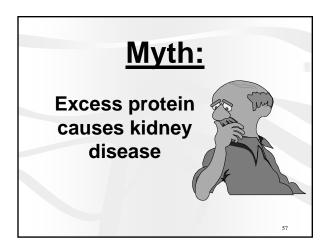






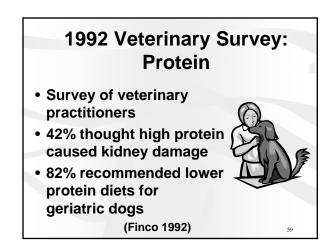


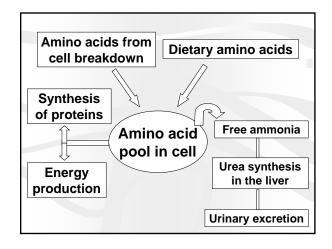






High dietary protein does <u>not</u> cause kidney disease in otherwise healthy dogs and cats

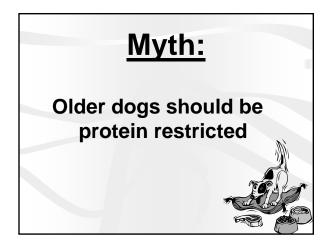




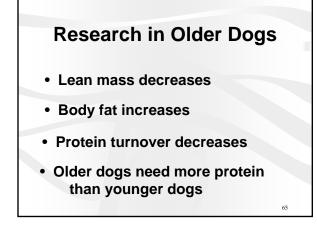
# Research: Protein and Canine Kidney Disease

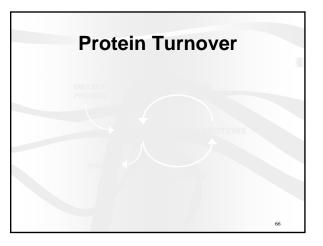
Researcher (Affiliation)	% Dietary Protein
Bovee (UPenn)	8, 18, 26, 54%
Bovee (UPenn)	19, 27, 56%
Robertson (UPenn)	19, 27, 56%
Finco (UGA)	18, 34%
Finco (UGA)	17, 34%
Finco (UGA)	16, 24, 50%
Polzin (UMinn)	8, 17, 44%
Churchill (UMinn)	<b>22, 39%</b>

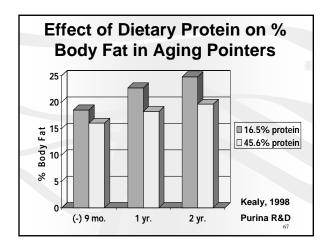
# **Fact:** • Diets between 10% and 40% protein had no adverse effect on kidney function • Diets differed in phosphorus and other nutrients

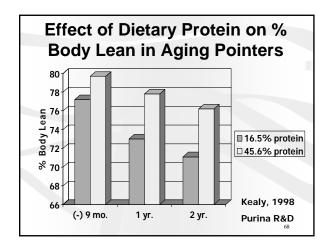


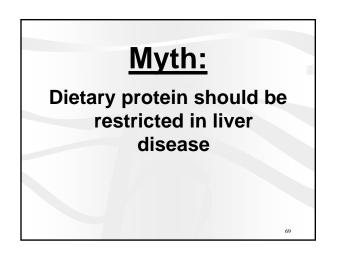


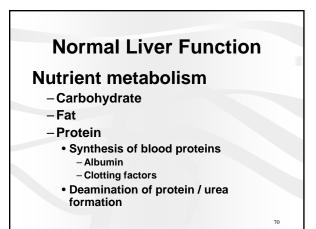


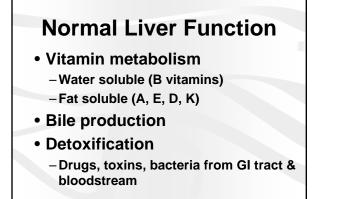












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## Liver Disease- Common Diagnoses

- Cat
  - Hepatic lipidosis (fatty liver)
  - Cholangiohepatitis (inflamed liver and bile tract)
- Dog
  - Portosystemic shunt (abnormality of blood vessels in liver)

- Cancer
- Cirrhosis (end-stage scarring)

## **Liver Disease**

 Treatment and diet recommended based on underlying disease

Basis of "liver diet" criticism

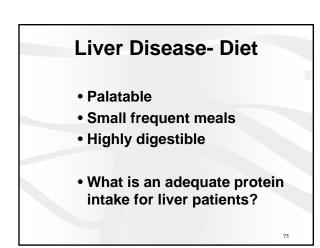
However, there are some basic nutrition principles...

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## Nutritional Goals with Liver Disease

- Provide enough nutrients to:
- Maintain pet
- -Promote liver cell regeneration
- Do not overwhelm remaining metabolic capacity
  - May lead to accumulation of toxic metabolites

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## Liver Disease- Protein

- Abnormalities in protein metabolism

   Theoretically, highly branched-chain amino acids would be beneficial, but proof is lacking
- Protein requirement is comparable to (or higher than) a healthy dog or cat
- <u>Bottom line</u>: Protein should not be restricted unless signs of protein intolerance (encephalopathic signs)

## Encephalopathic Liver Disease - Protein

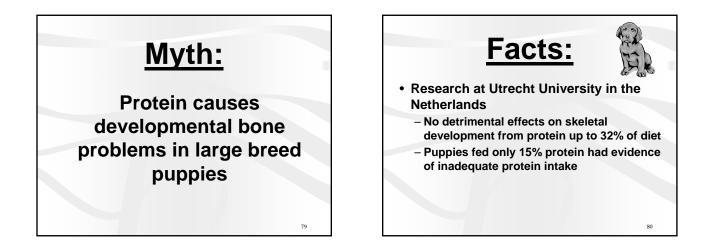
- Titrate protein level goal:
  - -Minimize neurologic signs
  - Maintain adequate blood protein levels
    - Albumin

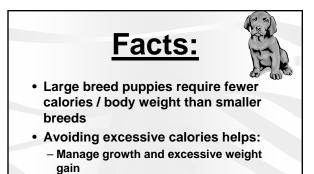
Liver Disease Summary
Multiple causes / multiple treatments
Diet is supportive therapy
Ensure adequate caloric intake

1/3 of caloric intake supports liver organ regeneration and function

Protein restriction only if protein intolerance (neurologic signs)

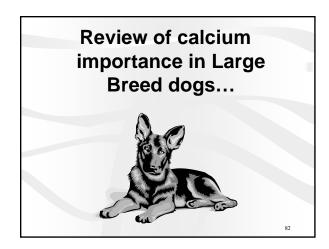
Liver patient has normal to elevated protein requirements
Highly digestible carbohydrate & fat

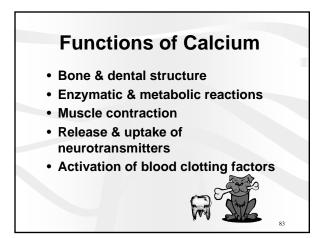


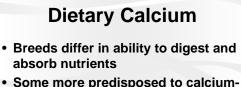


 Beneficial to skeletal development in large breed puppies

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- Some more predisposed to calciumsensitive conditions
- Some metabolize calcium more/less
   efficiently
- Calcium recommendations for puppies based on breed size?

## **Calcium Deficiency**

- Puppies:
  - Poor growth rates
  - Reduced mineralization of bone
- Subsequent defects: rickets, stress fractures

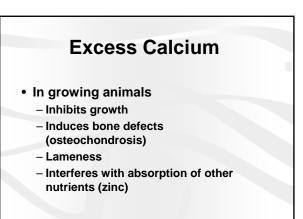
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Adult dogs:

puppies

- Depletion of bone calcium
- Weakened bone structure
- Muscle weakness



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## **Calcium & Large Breed Dogs**

- Avoid calcium less than 0.55%
   Deficient for growth
- Calcium 0.8% 0.9% (dry matter basis) – Adequate for Great Dane & giant breed
  - Marginal for other large breed puppies

Laflamme (2000 Purina Nutrition Forum) Effect of Breed Size on Calcium Requirements for Puppies

#### Calcium & Large Breed Dogs

- Calcium 1.0% 1.55%
  - –Safe & adequate for all breeds
- Calcium 1.5% 2.0% (dry matter basis)
  - Appears safe for large breeds
  - No data available for giant breed puppies

Laflamme (2000 Purina Nutrition Forum) Effect of Breed Size on Calcium Requirements for Puppies