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## Lecture 10

### Cat & Dog Nutrition

#### *Notes*

#### BMR vs. SMR

- Animals have a particular energetic rate within their body
- Basal Metabolic Rate (BMR) - Rate we sit comfortably at
  - Heat production in a thermoneutral environment (33 degrees) at rest (mentally and physically), more than 12 hours after the last meal. – Used in endotherms.
- Standard Metabolic Rate (SMR)
  - Metabolic rate standardized at a temperature, usually 20, 22 or 25°C. – Used in ectotherms as they do not have a “thermoneutral”
- LCT (Lower critical temperatures)
  - Ambient temperature below which the BMR becomes insufficient to balance heat loss, resulting in falling body temperatures
  - Must expend energy to keep warm
- Upper critical temperature (UCT)
  - Ambient temperature above which the BMR causes body temperature to rise
  - Must actively lose heat
- Really difficult to keep small animals at this temperature, especially when they're sweating lots
- Thermoneutral zone: Range of temperatures at which an animal does not have to actively regulate its body temperature.

### Effect of wind and rain on DE requirement of horses at maintenance

- Horses may not be able to eat enough to sustain this temperature; thus, rugs & shelter become necessary
- feed level + metabolism = increased heat production.
- Feed intake will decrease as UCT is approached - To metabolic heat generation.
- Reverse also true.

### Pepper

- As an adult will be eating around 500 kj of energy per kilogram of body weight
- Cats grow very rapidly up to about 6-8 months of age; at weaning they're at twice the energy level of an adult
- This slows down as they get older
- Labrador retriever - 2 years: 593kl per kg/body weight, 7 years - 464 kj/kg of body weight

### Nutrition for Dogs

- Taurine is not an essential amino acid for dogs, but it is for dogs
- Dogs must have essential fatty acids - linoleic acid & arachidonic acid
- Carbohydrates; same as cat - no requirement for carbs
- Meat diet gluconeogenic - generate glucose from sources of protein - don't need carbohydrate for glucose
- Glycerol converted to glucose in the liver
- Carbohydrates are often used in pregnancy diet to increase the energy intake
- Feeding regime for junior food is based around predicting the adult weight of the puppy
- Genetic by environment interaction also has an important effect on their weight
- In adult dog food, choose the dogs weight and judge activity level
- Dry Matter is very rarely listed on the can -  $\frac{4}{5}$  of the can is water.
- Most foods have 'fresh' information on them.
- Energy is very rarely listed on the can; pet food manufacturers have only just started giving the energy content on the can
- Most cans will only list protein, fat and fibre - you can work out the energy content on the can with this information
- Can look at percentage content on each can, and work out how much of something is in the can and work out the energy content from there
- There are no Australian standards looking at pet food - no board governing them

## Energy

- To work out the level of energy we need to look at the percentage of something in there and work out the energy
- Need to standardise the measure - 1kg - what is the energy content of a kilo of the food?
- $(\% \text{ protein}/100) \times 1000 = \text{protein g/kg}$
- $(\text{Protein g/kg}/1000) \times \text{energy content/kg} = \text{MJ/kg}$
- Whiskas's
- 1% fibre:
- $(10/1000) \times 17.0 = 0.17 \text{ MJ/kg}$
- Gross energy = protein + fat + fibre
- Gross energy =  $1.9 + 1.95 + 0.17$
- Gross energy = 4.02 MJ/kg
- For dog food is 3.10 MJ/kg

## Animals Needs

- 30kg dog
  - 6.4 MJ/day
- 5kg cat
  - 1.8 MJ/day
- 30kg dog
  - Need/food content = weight of food
  - $6.4/3.1 = 2.06 \text{ kg}$
- 5kg cat
  - $1.8/4.02 = 0.448 \text{ kg}$

## Feeding instructions?

- Is your average consumer in woolies/coles going to be making these calculations - no.
- Relying on the information of the can
- Protein: 6.0%
- Crude fat: 4.0%
- Crude fibre: 1.0%
- Most information on the can is pretty poor - probably associated with dog obesity
- We are luckier these days with websites - probably have more information