Module 13
Diet, Feeding and Animal Welfare

Student Activities

Questions

1. Is the following statement true or false? Explain your answer.

Only three of the Five Freedoms are affected by availability of food: freedom from hunger and thirst; freedom from pain, injury and disease; and freedom to perform normal behaviour.

(4 marks)

The statement is false. Food also affects freedom from discomfort (thin animals find it harder to stay warm in cold conditions; overweight animals find it harder to cool down; overweight animals may have difficulty walking). Food and feeding also have an effect on freedom from fear and distress (predation; role of dietary tryptophan in hysteria in laying hens).

2. Name three painful conditions that are caused by nutritional problems.

(3 marks)

- Rickets due to vitamin D deficiency: leads to bone fractures
- Hepatic lipidosis: enlarged liver and swollen abdomen
- Laminitis: carbohydrate-rich diet causes inflammation of the hoof laminae (in horses this important problem is caused by dietary imbalances, and in cows this is a consequence of ruminal acidosis)
- Obesity: can lead to joint disease/arthritis
- Tendonitis and lameness: in broilers this is due to rapid growth rate and large appetite

3. Is the following statement true or false? Explain your answer.

Feeding straw to dairy calves prevents them from getting abomasal ulcers.

(2 marks)

The statement is false. Straw increases the occurrence of abomasal ulcers in dairy calves, perhaps due to it abrading existing ulcers that have arisen while calves are being fed on a milk supplement only.

4. What causes tail-biting in baby pigs?

(4 marks)

A combination of:

- Early weaning
- Nutritional deficiency at weaning
- Lack of manipulable material in the creep area, while with the sow
- Lack of manipulable material after weaning

5. The local zoo has just acquired a new animal called a yellow-eyed junco. Staff at the zoo ask you to advise them about environmental enrichment (EE). If you were designing an enriched feeding system for the animal, which questions would you ask, and what would you find out about the animal?

(4 marks)

Minimum of four from the list:

- Find out how the animal feeds in the wild.
- What does the animal eat (is it a carnivore, herbivore, etc.)?
- How often does the animal eat?
- What are the duration and distance between forage areas and/or frequency of hunt?
- How many dimensions does prey move in?
- Is it a group or solitary animal?
- Does the animal have any special physical adaptations for hunting/foraging?
- What senses does it use to find prey/forage?
- How is prey captured and killed?

6. Give two specific examples of 'un-enriched' feeding systems that are commonly used for captive animals. Explain:

a) what would be a better system, and

b) how the new system would improve welfare.

(4 marks)

- Dairy calves: bucket-fed twice daily
  (a) *ad libitum*, nipple-feeder
  (b) satisfies appetitive component of feeding motivation.
- Horses: hay as the only forage
  (a) selection of forages
  (b) satisfies motivation to eat a variety of forages.
- Pigs: fed from a localised source, e.g. trough or hopper
  (a) puzzle-feeder (e.g. Edinburgh food ball) or food scattered through bedding
  (b) satisfies appetitive component of feeding motivation.
- Cats: fed *ad libitum*
  (a) puzzle-feeder or hide food around the house or pen
  (b) satisfies appetitive component of feeding motivation.

In-class activities

Discussions

We suggest 35 minutes for this activity.

This discussion will focus on how veterinarians should approach the subject of nutrition and feeding in relation to their clients.

Notes to lecturer:

Start by asking the class for any examples from their own experience of cases where a client's approach to meeting the nutritional needs of his/her animal has been discussed.

Now divide the class into small groups.

Prompt them to discuss whether veterinarians should communicate with their clients about the non-medical ways in which nutrition relates to welfare, e.g. stereotypies, frustration, over-eating in pet animals. Is it better to leave it to feed company representatives to communicate with clients about this? Is it better to avoid talking about it in case it offends the owner?

Are there examples of other non-physical welfare issues that veterinarians should raise with their clients? If so, what are they?

Key points:

- The idea behind this exercise to help students identify how comfortable they feel about talking to owners about the non-physical side of animal welfare.
- It should be realised that veterinarians should be raising these types of questions, even if the economics of food production or owner sensibilities make it difficult. It may not be necessary to try to change a feeding system, just to raise the topic in a positive and sympathetic way. For example, in a scenario where dairy calves who are bucket-fed, a vet could mention that ad libitum feeding with nipple-feeders has been very successful in terms of both growth rates and animal behaviour.

Class conference

In this activity, students create their own miniature scientific research conference. The topic of the conference is 'Stereotypies and their relationship to feeding'. The suggested timing for this activity is flexible and dependent on class size and time available. As a minimum, presentations should be approximately 10-15 minutes each, although this can be extended to reflect academic conferences that allow detailed presentations of research findings.

The students will need to present 'their' research and compare it with the research of others. Divide the class into small groups. Give each group two scientific papers (or have the groups find two papers themselves – the references at the end of the module may be helpful) which describe original studies about stereotypies as they relate to the feeding and welfare of captive animals. The students are to pretend that one of the papers is their own research, and the other is that of a colleague.

Each group should also have access to the papers listed below, which examine a slightly different area in the context of stereotypies and, where possible, relate to species which are farmed/raised in the local country.

Stereotypic behaviour in horses
Nagy, K., Bodo, G., Bardos, G., Harnos, A.,& Kabai, P. (2009). The effect of a feeding stress-test on the behaviour and heart rate variability of control and crib-biting horses (with or without inhibition). *Applied Animal Behaviour Science*, 121(2), 140-147. Retrieved from: www.behav.org/kabai/abstracts/kabai_horse_heart_rate.pdf

Stereotypic behaviour and its relationship to dietary fibre in pigs
de Leeuw, J. A., Bolhuis, J. E., Bosch, G., & Gerrits, W. J. J. (2008). Effects of dietary fibre on behaviour and satiety in pigs. *Proceedings of the Nutrition Society, 67*, 334-342. Retrieved from: http://edepot.wur.nl/16749

Stereotypic behaviour in broiler chickens affected by restricted feeding
Savory, C. J.,& Lariviere, J. M. (2000). Effects of qualitative and quantitative food restriction treatments on feeding motivational state and general activity level of growing broiler breeders. *Applied Animal Behaviour Science, 69*(2), 135-147. Retrieved from: http://directory.umm.ac.id/Data%20Elmu/jurnal/A/Applied%20Animal%20Behaviour%20Science/Vol69.Issue2.Sept2000/1679.pdf

Lecturers are advised to use their discretion in the awarding of marks and in the feedback given to students regarding their presentation skills. A good presentation contains typical sections such as:

- Introduction (describing the purpose of the research or task)
- Main content (the outputs from the options listed below)
- Summary/conclusion (rounding up all the findings and making concluding statements, linking back to the purpose outlined in the introduction).

A good presenter speaks clearly and slowly, and doesn't engage in distracting habits such as clicking a pen while speaking, or jangling change in his or her pockets. They should remain relatively still and not move about too much which can also be distracting to the audience.

PowerPoint slides should also contain a minimum amount of text and the presenter should know the subject well enough (or read from additional notes) so that the slide works as a prompt rather than the presenter simply reading the entire slide to the audience and adding nothing extra.

Applied learning opportunities

1) Developing an enrichment device (also applicable to module 26)

Present the students with the following design brief:

You are charged with designing a nutritional enrichment device for a brown bear kept in captivity. Brown bears are omnivores but mainly eat vegetation such as grasses, sedges, bulbs, and roots. They also eat insects such as ants, fish, honey, and small mammals, and in some areas they have also become significant predators of large hoofed mammals such as deer. Like other bears they have an excellent sense of smell which they use to search and identify food sources. The organisation that is responsible for the bear has limited funding, so the device needs to be able to produced relatively cheaply, i.e. for less than $300 per device.

The students should present their device in whichever way they see fit to the rest of the class, as well as describing a high welfare experimental setting in which they could test their device.

2) Surveying the interaction between food and welfare

Divide the class into groups. Each group should go to a different animal facility e.g. zoo, farm, veterinary hospital (including the veterinary teaching hospital at your school), pet shop, animal shelter. The students should research the nutritional requirements of the animals in their particular facility in advance of their visit.

They should observe the animals in the facility for one to two hours during feeding time and, using the Five Freedoms and guidelines such as the Welfare Quality® project, they should compile data on the adequacy of the nutrition for animal welfare. The data should include a description of the diet, and information on the animals' health and feeding behaviour. The students should then summarise their data for the class, discussing whether all nutritional and behavioural needs were met.

Important: This exercise may require some care. It is essential that the students do not judge the owners of the facilities, and that the students see their role as impartial researchers. The class professor may need to write an introductory letter for each group to send to the facility concerned (especially if the facility is privately owned), or the group should take the letter with them. The class professor may also wish to discuss the project with the dean or owner of the facility first). The students could provide the owner with a report of their findings, with practical suggestions for any improvements that might be necessary.