

## Questions Page -- Measuring behavior & welfare

### Week 1. Terminology

Who is Don Broom and what does he do for a living?

What is the difference between welfare and well-being?

What would one measure if they were to measure farm animal welfare?

What would you say if someone said that all you have to do is to measure growth rates or performance of farm animals and you'll know about animal welfare?

What does David Fraser think about the perception of animal agriculture? (this will require reading a 2001 [JAS paper](#)) Do you agree? What is the role of ethics in the Animal Sciences? Can science alone answer questions of farm animal welfare?

### Week 2: Concepts of measuring welfare: physiology, behavior, performance and health

Q1. Based on the book "Fraser and Broom", 1990.

Assessing short-term welfare problems:

- a) Identify two short term behavioral and two short term physiological methods of assessing welfare problems
- b) What effects can occur in final meat quality when an animal is exposed to both short and long term stressors
- c) How can species differences affect the way an animal may respond behaviorally to pain?
- d) Describe the pain pathways in animals: note the regions, fibers involved and how pain is transmitted.
- e) Describe how a veterinarian or a farmer can go through a three step process of figuring out if an animal is experiencing pain.

Assessing long-term welfare problems:

- f) What is the ACTH challenge technique?
- g) Define what a stereotype is
- h) Identify two other behavioral indicators of poor welfare
- i) What is preference testing?
- j) How has the simple preference test been criticized?

Q2. Based on the paper by Gonyou (1986).

- a) Is comfort and animal well-being objective subjective or a combination of both?
- b) Give an example of one objective and one subjective measure to assess animal comfort.
- c) Gonyou attributed three possibilities of how an animal may sustain physical damage – what are they?
- d) Briefly explain the findings by Tauson (1980) on physical damage to assess and improve chicken facilities.
- d) Do animals physiologically respond to environments based upon previous experiences? If yes give an example.
- e) Gonyou listed three problems related to an imbalance of motivation and environment – what are these?
- f) Gonyou noted that some behaviors become over stimulated through management practices imposed on farm animals – identify an example of this.

Q3. Based on the paper by Broom (1991).

- a) What is a need?
- b) Describe a simple and a complex need
- c) What is coping?
- d) Do animals always successfully cope with all situations they are exposed to? If not what symptoms may we see if an animal has not coped?
- e) Identify two examples of situations in which welfare can be poor in the absence of suffering.
- f) Broom identifies five measures of welfare. Identify what these five categories are. Next select two of these categories and give two welfare measures what could be collected in a field trial to help assess a sows' welfare when housed in gestation stall versus a group housed indoor pen.

Q4. Based on the paper by Swanson (1995).

- a) Is there a difference between 'welfare' and well-being'?
- b) McBride (1984) identified two approaches to solving confinement related problems in intensive environments – what are these two approaches and give an on farm example for both?

### **Week 3: Alternative concepts of animal welfare: feelings, physiology, vocalizations and asymmetry**

*Q1. Based on the Paper by Duncan (1993)*

- a) What components should a broad working definition of welfare include?
- b) Is it generally agreed that sentience in an animal is a necessary prerequisite for welfare?
- c) True or False – it has been clearly decided at the precise phylogenetic level at which there is sentience in an animal.
- d) What is sensing?
- e) What is awareness?
- f) Duncan listed three items of what welfare was not – list what they are and give an example for each.

*Q2. Based on the paper by McGlone (1993):*

- a) Refute or support McGlone's hypothetical theory "an animal is in a state of poor welfare ONLY when physiological systems are disturbed to the point that survival or reproduction are impaired "
- b) Do you think that the area between points A and B on Figure 1 are relevant? What can it tell us?

*Q3. Based on the paper by White et al., (195)*

- a) How do pigs express their discomfort (three ways)
- b) What does HEF mean?
- c) How was vocalization measured in this experiment?
- d) How was heart rate measured in this experiment?
- e) How was blood pressure measured in this experiment?
- f) Did vocalization differ when anesthetic was used? If so how?
- g) How did age affect HEF when anesthetic was used or not used?
- h) Was there any significant differences noted for piglets that received anesthetic or did not

receive anesthetic throughout the procedure of castration?

- i) At what point of the castration procedure did respiration differ significantly? What was the recorded *P* value?
- j) Do the results of this experiment agree or disagree with previous findings by other researchers?

*Q4. Based on the paper by Tuyttens et al., (2005):*

- a) Which traits provide the best estimate of fluctuating asymmetry?
- b) Refute or support this statement  
Our findings agree with the hypothesis that fluctuating asymmetry is a useful and valid indicator of the quality of an animal's environment during its development and thus is a good measure of welfare.
- c) In rabbits performance traits were not improved by housing conditions, thus is performance a good measure of welfare in rabbits?
- d) Which welfare issues in cattle, swine and poultry might find this method informative?

*Q5. Based on the paper by Bull et al., (1997):*

- a) What are the two main cooling systems used in the swine industry?
- b) How can the efficacy of the environment be assessed physiologically?
- c) In this experiment two genetic lines were used what were they?
- d) Were both genetic lines evenly represented in this experiment? If not does this raise a red flag?
- e) Fluorescent and incandescent lights remained on for the entire 24-h period to facilitate filming - is this a good experimental idea? Could continuous light affect diurnal patterns of the pigs? Thus would the data collected be meaningful?
- f) If you were to design a 24 h filming of pigs - how could you "get around" having lights on 24 h?
- g) In the results section the authors noted that the pigs choose to occupy stall position C a high percentage of their time and then added that stall position C had a solid partition on one end that the other stalls did not have - do you see a system design issue that may have affected the lying patterns of the pig? What could the authors have done differently?
- h) The authors noted in their discussion that gilts preferred the cooling pattern over the other two methods, they noted animal comfort was one reason - what other factors did they note that may have had an effect on why gilts choose the pad over the other systems?

## **Week 4: Short and long term responses**

### **Broom Chapters and Mostl paper**

According to Broom, which short-term responses are the best indicators for assessing welfare? what about long-term responses? Which of these do you think are the best? Why? Which of these do you think are not good indicators? Why?

Do you think Broom's behavioral examples are truly indicators of welfare problems, short-term? Why?

Measures of poor welfare are more common than measures of good welfare, thus should we be assessing good welfare instead of poor welfare?

Assessing welfare using short-term responses, really indicative of welfare problems?

Describe a scenario in which short-term responses would have a negative impact on fitness.

Do you agree with Broom that the best indicators of long-term problems for an animal are measurements of behavior? Why?

Are hormones better indicators that can be used to assess short- or long-term responses?

What are some of the factors that can impact the hormonal response to stress?

### **Hunt Paper**

Support or Refute the statement:

"For group housed mice, additional enrichment should be mandatory to reduce stress levels and therefore increase their welfare standards, while singly housed mice require only basic levels of enrichment and should be separated from their group for a min of 2 weeks before measurements are taken."

Is corticosterone concentrations the best hormone indicator that should have been used to assess the impact of group- vs.. singly-housed males in this study? Why?

What hormone or method may have been better choice?

Why do you think mice housed in high-enriched environment spent more time sleeping? Does this imply better welfare?

### **Hulbert Paper**

Does this paper assess welfare using short- or long-term responses? Did they use the most appropriate responses to assess welfare?

Based on the phagocytosis response rank the treatment groups from best to worse welfare (pen-drop-fed sows, pen-trickle-fed sows, crate-drop-fed sows, crate-trickle-fed sows ? Justify

your answer.

In this study, do the behavioral differences tell us anything about the welfare of the sow in these different housing environments with different feeding systems.

Which sows would you consider to have better welfare? Why?

## **Week 5**

[Click here for questions for week 5](#)

## **Week 10**

**Blecha review paper – no questions.**

### **Davis, 1998, -- Domestic Animal Endocrinology**

This paper is a summary paper that uses three hypothetical examples to show that some of the endocrine hormones may actually mediate immune function in response to stress.

**Q.** What is the bidirectional control between the endocrine and immune systems for example of the three examples Davis proposes?

**Q.** What is the proposed role of prolactin in response to stress? In response to stress, what would happen if you blocked prolactin secretion?

**Q.** What is the proposed role of growth hormone in response to nutritional stress? Would increasing IGF-I be beneficial to an animal under these circumstances?

**Q.** What is the proposed role of thyroid hormone in response to cold stress? Speculate, what might happen if you were to increase thyroid hormone during hot weather?

### **Kanitz et al., 2004 – Brain, Behavior, Immunity**

**Q.** If social isolation of neonatal pigs leads to long term effects on activity of the HPA axis and brain-endocrine immune system

- a. Do you think that these pigs would respond to this same stressor the same way later in life?
- b. Do you think these alterations in the HPA axis and brain-endocrine immune system would affect how these animals respond to other physical stressors later in life? What about psychological stressors later in life?
- c. If you were to breed these pigs, how do you think the offspring of these pigs would respond?

### **Berge et al., 2005 – J Dairy Sci**

Refer to the use of “animal welfare” in the following sentences to answer the question.

\* p 2169, data analysis section – “For analytical purposes, calves removed from the trial for “animal welfare” reasons were treated as dead.”

\* p 2170, results section – “Ten calves, not eligible for antibiotic treatments, were removed from the study for animal welfare reasons because their clinical status was deemed critical.

**Q.** Do these authors use the term “animal welfare” properly? Why or why not? Is there a term that would have been more appropriate?

**Q.** Do you think in feed antibiotics would have delayed onset of morbidity, decreased overall morbidity and increased weight gain in a healthy herd?

**Q.** Which one indice would you potentially use to enhance the overall health and performance of your herd? Why?

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