Animal welfare – a new program area at ISU-CVM

Suzanne Millman, BSc (Agr), PhD
Associate Professor - Animal Welfare
VDPAM, BMS, College of Veterinary Medicine
Iowa State University, Ames IA
smillman@iastate.edu

Animal welfare program at ISU-CVM

- Train DVM students to understand animal welfare, esp. in relation to animal production
- Provide extension to producers, public about animal welfare issues, bridge dialogue about needs and expectations
- Develop a research program to address animal welfare issues, esp. in relation to animal production

Extension and education for veterinarians, producers and public

- Seminars, symposia and reviews on “hot topics” to keep informed on current science and policy
- Active website (with Dr. Anna Johnson) as “front desk” for animal welfare information, upcoming events and query/discussion board
- Collaborative on-farm research projects to implement and evaluate welfare interventions and marketing opportunities
- Assisting producers and veterinarians in responding to food animal behavior and welfare situations

Iowa Animal Care Response

- Task force established June 2008-IVMA, ISU CVM, ARLI, IA State Veterinary Office
- Coordinate efforts for animal cruelty, emergency response
  - Training program for DVMs and law enforcement about IA cruelty statutes (launched IVMA Feb. 10 ‘09 meeting)
  - Coordinate response and education with commodity groups, extension agents, shelters

ISU-CVM Welfare Team
- new additions

Dr. Ray Brooks

Animal welfare – a multidisciplinary approach

Animal welfare is the state of an animal as it attempts to cope with its environment
- Biological function
- Affective states
- Nature

Human action, responsibilities
Care of the compromised animal: A survey of hospital pens used on Ontario swine farms

- 108 producers were interviewed by veterinary team during annual surveillance project visit
- Questions about the use of hospital pens and associated health management
- Team viewed and photographed the pens where possible


Managing convalescence

Variation in terminology used, and attitudes/attention to sick pigs
- “Hospital pen”
- “Infirmary”
- “Treatment pen”
- “Isolation pen”
- “Sick pen”
- “Death pen”

Decisions about humane endpoints and euthanasia particularly difficult & inconsistent
Psychological factors
Economic factors
Logistical factors

Current study: Assessing captive bolt technology for on-farm euthanasia

- Non-penetrating for up to 30 lbs
- Three bolt lengths for older pigs, including mature sows and boars
- Cadavers, then on-farm data collection

Masters Thesis project, Ms. Jennifer Woods

Rethinking sickness behavior: Caring for the compromised animal

Behavioral responses of animals during onset of systemic infections are relatively consistent across species in response to bacterial, viral and protozoan pathogens

Hart proposed the concept of “sickness behavior” as a highly organized, evolved behavioral strategy, and facilitates febrile response

Behavior tests to “ask” animals about their needs and preferences

Swine model: antibiotic associated diarrhea (sickness behavior)

250 mg/kg ampicillin was fed to piglets in milk solution on successive days

Mild to moderate diarrhea within 24-36 hours, recovery by 72 hours

Gray, Colgoni, vanderVine, Sheppard, Millman, 2005. ASM General Meeting, Atlanta

Effects of microflora shift on behavior of weaned pigs

One pig was treated with ampicillin, penmates received placebo doses

Video analysis to compare behavior of treated pig vs. penmates and control pens

No differences in feeding behavior

Aggression by treated pig increased on Day +3 (P<0.006)

A Colgoni, JT Gray, ST Millman, 2006

Effects of *Salmonella Typhimurium* on the behavior of group housed swine

Determine the behavioral changes that accompany *Salmonella* infection in group housed newly weaned swine.

- Identify parameters for on-farm clinical scoring
- Identify changes in the time-budget
- Identify changes in social behaviour such as aggression and abnormal behavior

Janet Higginson, MSc Thesis, 2008

Microflora shift:
lac+ amp-resistant coliforms

(Colgoni, A, Gray, J.T., Millman, S.T., in preparation. The impact of gastrointestinal microflora shift on social behavior of group-housed swine.)

Study Design

- **Disease Model**
  - $10^7$-$10^8$ CFU *Salmonella Typhimurium* (Gray et al., 1996)
  - 1 seeder per pen
  - Transmission determined at necropsy

- **Experimental Design**
  - 2x2 factorial design, 3 trials

- **Treatments**
  - 2 *Salmonella* strains: cmy2+ antimicrobial resistant strain (Salm-AMR) and cmy2- (Salm)
  - 2 diets: starter diet with (TET) and without tetracycline (NO TET)
Seeders performed less rooting (seeder-by-day \( p=0.04 \))

- Diet effect (\( p=0.006 \)), TET diet spent ~50% less time rooting

Transmission \( p>0.05 \)

- Tetracycline \( p=0.006 \)

Drinking

- Seeder \( p=0.58 \)
- Day \( p=0.45 \)
- Transmission \( p>0.05 \)
- Diet \( p=0.01 \)

Abnormal Behavior

- Transmission associated with abnormal behavior (\( p=0.007 \))
- Diet (\( p=0.0009 \)) and *Salmonella* strain (\( p=0.03 \)) effects

Aspects of the therapy and behavioural impacts of neonatal calf diarrhea complex

Cynthia Todd
MSc Thesis Defence

Kaplan-Meier survival function curves for time to starter ration consumption

- Meloxicam
- Placebo
- Censored Obs.

Log-Rank: \( p=0.0409 \)
Wilcoxon: \( p=0.0034 \)

- Cox proportional hazards model controlling for farm of origin, arrival body weight and age at treatment (HR=3.19, \( p=0.001 \))

Experimental Methods

- Enrolled at the natural onset of diarrhea
- Double-blind controlled study
- Random assignment of calves to treatment
- Single subcutaneous injection of meloxicam or placebo
  - 0.5 mg/kg body weight
- Oral electrolyte solution offered to all calves
Summary, Cynthia Todd MSc

- Meloxicam-treated calves maintained a stronger appetite for milk during sickness
- Meloxicam-treated calves began consuming starter ration earlier and at a faster rate
- Meloxicam-treated calves consumed more water
- Meloxicam-treated calves gained more body weight
- Meloxicam-treated calves tended to wean earlier but with no difference in weaning weight