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## Cattle Temperament: Effects on Health and Reproduction

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## Outline

- Introduction
- Health
  - Immune function
  - Production and growth
- Reproduction
- Economics

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## Introduction: Temperament of cattle

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## Temperament of cattle



- Definitions:
  - Changes in behavior such as fear response to humans and/or to novel environments, Burdick et al. 2011
  - Fear response or the degree of reactivity to human or to novel environments, Carroll 2015

**Excitability!!**

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## Contributors to temperament

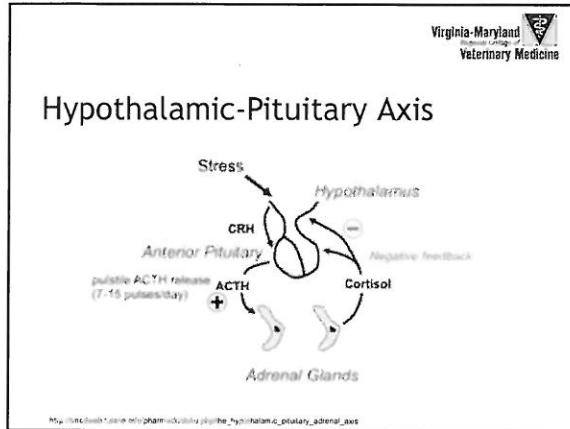
- Breed
- Gender
- Age
- Previous handling
- Genetics

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## High Temperament Cattle

- Some have been thought to be “protective” mothers
- Many are just aggressive and too excitable
  - Studies suggest high levels of cortisol
  - Negatively affected by stress



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### Stressors

Physical + Psychosocial	Detrimental effects
• Handling	• Immune function
• Weaning	• Growth
• Castration	• Carcass traits
• Transportation	• Reproduction
• Regrouping	

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### How to measure?

- Pen score
- Chute score
- Exit velocity

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### Pen Score

- Measure of reactivity to human observer in the pen with cattle

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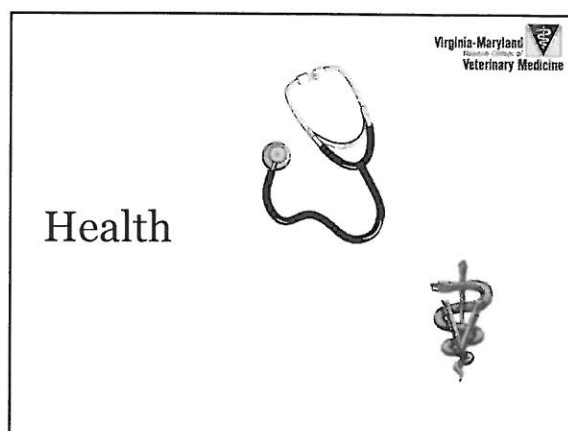
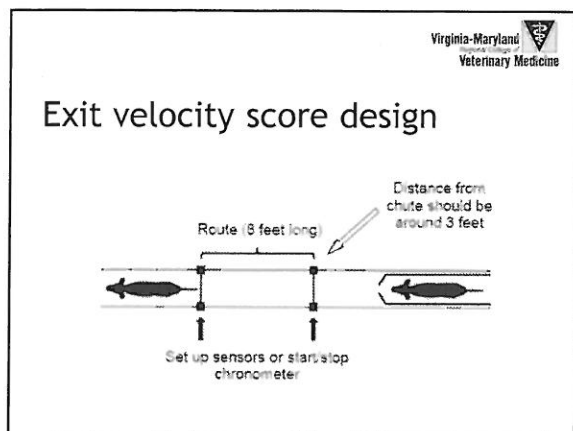
### Chute Score

- 5-point scale assigned when cattle are restrained in a chute
  - 1 = calm, no movement
  - 2 = restless movement
  - 3 = frequent movement with vocalization
  - 4 = constant movement, vocalization, shaking of the chute
  - 5 = violent and continuous struggling

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### Exit Velocity or flight speed

- Measured by infrared sensors as cattle exit the chute
  - 1 = walk
  - 2 = trot
  - 3 = run
  - 4 = jumping out of chute



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- ### The immune system
- High basal cortisol levels can affect how well the immune system works
  - Can cause decrease of other factors that affect immune cells
  - May impair cattle's response to vaccination

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- ### Sick cattle
- Producers identify sick cattle through visual observation of general health
  - Sickness behavior is determined and then cattle pulled for evaluation
  - Excitable cattle display diminished sickness behavior - -> **untreated cattle!**

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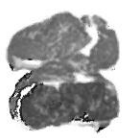
### Production and growth

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- ### Metabolism
- Temperamental cattle require more energy for their metabolism
  - They are considered inefficient in utilizing nutrients for maintenance and growth
  - Reported lower ADG and BCS
    - May be due to their increase in activity and arousal level

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## Feedlot considerations


- Reduced feed intake and growth rates
- Reduced carcass weights and overall fat
- Less palatability of meat
- Darker meat color
- Less tender meat



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## Reproduction



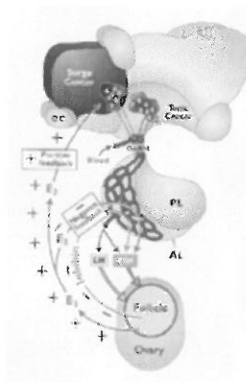
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## Reproductive efficiency

- Decreased nutritional status may affect cycling activity
- Stress-related hormones impair fertility
- Cortisol may alter mechanism involved in ovulation and conception pathways

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## Hypothalamic-Pituitary-Ovary Axis

- Elevated cortisol may inhibit release of FSH and LH
- Calmer cattle tend to reach puberty sooner
- may affect oocytes

Singer 2010 Pathways in Pregnancy and Parturition

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## Reproductive efficiency

- Excitable cows have reduced pregnancy (88.7% vs. 94.6% ) and calving rates (85% vs. 91.8%) (Cooke et al., J Anim Sci 2012)
- Temperament may adversely affect the offspring
  - Decreased BW and other growth traits
- Acclimation may not improve attributes

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## Acclimation of excitable cattle

- Temperament of cattle is considered to be moderately heritable
- Acclimation to human handling may reduce some of the stressors that the cattle experience
- Environment also has a significant effect

## Conclusions

- Selection of docile cattle is the first priority in ensuring overall performance
- Excitable cattle can have reduced growth, overall health, and reproductive traits
- Attempts to reduce stressors may help
  - Acclimation and low stress handling techniques can be useful for producers

Any Questions?