ANIMAL WELFARE

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Historical Context
Why do we always talk about agricultural animals?

World history – post WWII
- industrial/mass production believed to have played large role in Allied victory

Scientific advances

Animal agriculture then...

Animal agriculture now...
Changes in animal agriculture

- increased scale
  - ex. poultry industry
  - 8 billion broilers per year
  - hundreds of thousands or millions of birds/farm
- vertical integration
  - all phases under single company/entity
  - contract growers
- dramatic increase in farm size

Concerns about farm animal welfare in Europe

- 1964: Ruth Harrison publishes “Animal Machines” – criticism of intensive farm conditions
  - What did she see?

The egg industry

The broiler industry

The pork industry

What is an animal to do?

In nature
- find food
- find mates
- engage in social interactions
- avoid predators
- maintain territory (patrolling, marking, defending)

In captivity
- static and predictable
- limited opportunities to perform some behaviors
- too much opportunity to perform others
Concerns about farm animal welfare in Europe

- 1965: Prof. Rogers Brambell commissioned by UK gov't to investigate welfare of intensively farmed animals
- 1967: Farm Animal Welfare Advisory Cmte
  - 1979: re-named as Animal Welfare Council

What was/is at the heart of the issue?

- assumption that unmitigated, unalleviated negative physical & emotional states cause suffering
  - pain, fear, stress, boredom, frustration
  - suffering = unacceptable welfare

Five Freedoms (1979)

Freedom to...
1. ...turn around
2. ...groom
3. ...get up
4. ...lie down
5. ...stretch their limbs


Freedom...
1. ...from thirst, hunger and malnutrition
2. ...from thermal and physical distress
3. ...from injury and disease
4. ...to express most normal behavior of the species
5. ...from fear

Practices of concern

- restriction of movement
- barren environments
- restriction of social behavior
  - group size
  - group composition (sex, age)
  - mother-offspring bond
- lack of regular positive interactions with humans
- specialized agricultural practices
  - castration, dehorning, beak-trimming, toe-removal, branding, tail clipping
- handling, transportation, slaughter
  - fear due to handling
  - transport
  - stress due to lack of food and water,
  - unfamiliar animals
  - non-ambulatory animals (“downers”)
  - slaughter
    - humane if method
  - food and/or water deprivation
    - feed restriction of sows and parents of broiler chickens
    - water removal or restriction to prevent stereotyped drinking
- environmental quality
  - air quality (dust and ammonia)
  - thermal control
  - automation
  - Does the machinery "mesh" with the animal?
- lack of inspection
  - disease (incl those caused by production pressures)
  - musculo-skeletal problems
  - lameness in dairy cattle and broiler chickens
  - osteoporosis
  - mastitis
    - painful inflammation of the udder in dairy cattle
  - injury (incl those caused by production pressures)

Now what?

Enter animal welfare as scientific discipline
Animal welfare issues
- tackle big question: Can animals suffer?
- develop operational definitions of "acceptable" welfare
  ⇒ standardize ways to measure "acceptable" welfare
- evaluate the "Practices" – do they cause animals to suffer?
- develop methodology of asking animals what they prefer

What is animal welfare?

Animal welfare is...
- ...an integrative & applied scientific discipline
- ...aimed at understanding how animals perceive their environment
- ...applies to situations where human and animal interact (incl human impact on animals)
  - agriculture, companion, research, wildlife

Animal welfare:
1. scientific question
   - investigate how animal welfare can be assessed and improved
     - welfare is a property of the animal itself
     - continuum from poor to excellent
2. social construct
   - human ethical attitudes towards animals
   - standards for treatment of animals impacted by humans

Science of animal welfare
- Physiology
- Genetics
- Psychology
- Evolution
- Behavioral ecology

Approaches to evaluating animal welfare
1. "Set point" (biological functioning)
   - "acceptable" welfare based upon animal's ability to adapt (maintain homeostasis)
2. Telos
   - "acceptable welfare" = animals must behave/live according to their natures ("birds gotta fly, fish gotta swim")
3. Feelings
   - welfare based on the animal's (+)/(-) feelings
How to apply?

- “Set point” assesses welfare through:
  - health
  - physiology
  - “productivity” (growth and reproduction)
  - behavior
- “Telos” assesses welfare through:
  - behavior
- Feelings assesses welfare through:
  - behavior
  - preference testing

Animal welfare is not...

Animal welfare ≠ Animal rights

Can animals suffer?

- fit btwn environment & animal
  - ability to cope/adjust
  - pain perception
  - cognitive abilities

Domesticated species shouldn’t suffer because the fit between animal and environment should be good…

What happens to behavior during domestication?

- premise: behavior is adaptive and shaped by evolutionary pressures
  - natural selection operates on the individual to effect population level changes

What is domestication?

- process of adaptation to humans and captive environments
  - result of interplay btwn genetic changes across generations AND environmental stimulation and experiences during development of the animal
What is domestication?

- open-ended process
  - ex. change existing dog breeds and create new ones

What happens when we do this?

Relaxed natural selection

Fitness = survival + reproduction

Natural selection in captivity*

Fitness in captivity = survival in captivity + reproduction in captivity

* passive process
Natural selection
- “Survival of the fittest”

Relaxed natural selection (in captivity)
- advantage of “Survival of the fittest” doesn’t apply as much
- passive & non-directional process

Artificial selection
- anthropogenic = generated by humans
- intentional; produces rapid changes
  ex. growth, reproduction and other production traits in farm animals
  ex. phenotypes (physical and behavioral) in dogs and cats
  ex. disease expression in laboratory animals (animal models)
Artificial selection

- BUT unintentional selection also occurs
  - ex. caretakers unconsciously favor animals that are easier to handle
- artificial selection can reduce fitness by providing a selective advantage for non-adaptive traits
  - ex. selection for “tame” animals = less responsive physiological systems

Domestication: changes in behavior

- potential changes due to relaxed natural selection
  - behavior toward predators
    - ex. domesticated rodents less likely to “freeze” than wild rodents
    - ex. farmed salmon swim to shelter as quickly as wild salmon when confronted with a predator, but emerge sooner
    - more susceptible to predation if released into wild

Domestication: changes in behavior

- potential changes due to relaxed natural selection
  - maternal behavior
    - ex. dairy cows show less intensive maternal behavior than beef cows, laying hens hardly ever get broody
  - reproductive behavior
    - ex. males with poor mating technique, low libido, or undesirable characteristics (to females?) can still leave the most offspring (esp. true with artificial insemination)

Domestication: changes in behavior

- some changes are due to effects of selection for other aspects of phenotype (correlated traits & pleiotropy)
  - ex. selection for large breast muscles in turkeys rendered males physically incapable of mounting females (true for many bulldog breeds)
  - ex. selection for high egg number resulted in decrease in broodiness in by laying hens
Domestication: changes in behavior

Correlated traits in silver foxes (Belyaev 1984/85)

- Selection criteria:
  1. Tolerate petting
  2. Tolerated hand-feeding

Domestication: changes in behavior

- Pups open eyes earlier
- Delayed development of fear responses
- Delayed development of cortisol response systems
- Earlier sexual maturation, larger litters
- Coat color changes (loss of pigmentation) and other physical changes

Domestication: changes in behavior

- Study on mink & sable support Belyaev’s findings (Trapezov et al 2008)

Changes in behavior: what’s going on?

- Based on studies:
  1. Comparing the behavioral repertoire of domesticated animals and their wild ancestors
  2. Feralization

  Differences are in DEGREE, not KIND
  ⇒ incr or decr in frequencies of behaviors, not +/- of behaviors to the repertoire

What happens to behavior in captivity?

- Many behaviors are thwarted
  - If thwarted behavior is internally driven (behavioral need) often results in frustration
  - If thwarted behavior is induced by external stimuli, modifying environment (environmental enrichment) may prevent frustration
- Too many opportunities to perform others

Fit between animal and environment
Agency and challenge
- animals as agents
  - actively shape their world
  - not simply responding to environmental stimuli
- nature rife with challenges – food, mates, territories, predators
- fitness = ability to overcome challenges

Animals seek challenges (and take risks)

Why seek challenge?
- the future is uncertain
- new objects, situations and events
- learning as much about potential challenges in advance is important for survival
- exercise in creative problem-solving

Seeking challenge
- contrafreeloading
- exploration

Dealing with challenge
- competency & agency
  - competency: cognitive & behavioral abilities that an animal possesses
    - honed thru development & learning
    - BUT if organism remains passive and attempts to martial responses to challenges when already faced with them, sometimes may be too late to figure out solution
    - SO, helpful to invest in future – store resources & gather information
  - agency: propensity of animal to engage in environment to gather information
- agency + competency = animal's ability to integrate array of behavioral & cognitive activities into adaptive conduct to optimize survival & well being
  - usually combination of proactive & reactive behaviors