

## Unit 1

### Intro to ASCI:

- Proposition 12 (2018): more space for chickens, cage free. Extension of proposition 2 (2008), enriched colony cages
- Ruminant stomach- found in cows, sheeps, etc.
- What is science?
  - “The systematic study of the structure of the behavior of the physical and natural world through observation and experiment.”
  - Knowledge covering general truths and tested through the scientific method
- Pig looks like it's setting up a soft space (nest) for her soon to be born piglets to increase the survival of her babies
- One of the oldest sciences studied by mankind, when man started domesticating domestication 10,000 - 14,000 BC
  - First domesticated animal = wolf
- **Animal science** - the study of the biology of animals under the control of mankind
  - Husbandry
  - Reproduction
  - Nutrition
  - Veterinary
  - Genetics
  - physiology/metabolism
  - Behavior
  - Welfare

### Domestication:

- Domestication of the wolf happened ~15,000 years ago
- Cows, sheep, and swine filled the wolf 5,000 years later
- Domestication occurred between 8,000 - 10,000 BC (Neolithic Era)
  - Shift from nomadic lifestyle
  - Insects can also be domesticated, madagascar hissing cockroach
- **Domestication**
  - A process where animals change genetically (DNA) and phenotypically (behavioral + physiological)
  - Driven by human desired traits
  - Takes generations to see evidence of persistent genetic and phenotypic change

**Natural selection** (adaptation) - “process that results in the adaptation of an organism to its environment by means of selectively reproducing changes in its genotype, or genetic constitution” britannica

**Artificial Selection** (adoption) - “describes the human selection of breeding pairs to produce favorable offspring” biology dictionary

Horses, cows, sheep, etc are domesticated because humans use the resources they produce to sell (milk, meat, eggs) or they are used for show and travel (horses). Mostly for our benefit.

Bears, tigers, raccoons, and rhinos weren't tamed because we didn't have a use for them and still don't and they were probably much more vicious than the others.

List: food, transportation, entertainment, fast growing animals, easy breeding, strong, adaptability, hardiness, ease of tending

Important Breeds to Know in Agriculture

	Important Breeds
Dairy Cattle	<ul style="list-style-type: none"> <li>• Holstein</li> <li>• Jersey</li> </ul>
Beef Cattle	<ul style="list-style-type: none"> <li>• Angus</li> <li>• Hereford</li> <li>• Brahman</li> </ul>
Poultry (Chicken)	<ul style="list-style-type: none"> <li>• Leghorn</li> <li>• Plymouth Rock</li> <li>• Cornish</li> </ul>
Swine (Pigs)	<ul style="list-style-type: none"> <li>• Yorkshire</li> <li>• Hampshire</li> </ul>
Equine (Horses)	<ul style="list-style-type: none"> <li>• Quarter Horse</li> <li>• Thoroughbred</li> <li>• Mustang</li> </ul>
Goats	<ul style="list-style-type: none"> <li>• Boar</li> <li>• Kiko</li> </ul>
Sheep	<ul style="list-style-type: none"> <li>• Dorper</li> <li>• Rambouillet</li> </ul>

**Response to humans:** tamable, small flight zone, non-aggressive toward humans, readily controlled, attention seeking

**Social behavior:** live in groups, have dominance hierarchies, territorial behavior is minimized, regular grooming activities

**Adaptability & activity:** wide environmental tolerance, absence of specialized dietary needs, limited agility, small home range

**Juvenile characteristics:** temperament, dependency, quicklearning, curiosity, willingness to associate with other species

**Sexual behavior:** promiscuous mating, clear sexual signaling behaviors between males and females, able to breed in captivity

**Precocial development:** young are relatively mature and mobile from birth, initial rapid strong bonding of mother and young, young can be separated from parents at early age

**Precocial** - hatched or born able to feed itself immediately Ex: horses, chickens, cattle

**Altricial** - requiring nourishment Ex: dogs, humans, cats

**Biological changes:**

- decrease in ratio of brain size to body size
- Increased muscle, milk production, or economically favorable changes
- Faster growth rate and changes in pattern fat deposition

**Behavioral Changes:**

- Loss of self sufficiency
- Less adaptable
- Loss of pair bonding
- Loss of broodiness in chickens and turkeys
- Reduced flightiness and aggressiveness
- Increased juvenile characteristics

## Unit 2

### Prior to 1950:

- Simple life
- Nature as an ideal
- Small family farms
- **Subsistence agriculture** - producing food only to sustain yourself and your family

### After 1950:

- Intensification of agriculture occurred because fewer farmers needed to produce more food for more people that were living in the city
  - Population of people living in cities increased: 1950 = 746 million, 2014 = 3.9 billion, 2045 = ~6 billion

### The US Agro-Industrial Age (1960-1970):

- Corn was the favored crop due to high yields and low spoilage
- Its low price didn't justify shipping it so it became livestock feed, this allowed farmers to feed a nutrient dense food and thus raise a lot of animals all at once
- **Confinement feeding** emerged - raising animals indoors. Corn provided the perfect formula to feed mass animals: it was cheap and easy to grow
- Cage systems became predominant in egg collection. Conveyor belts replaced hand collection and took the eggs straight to washers (1960s).

This shift in animal housing allowed producers to meet the needs of the consumer on a large scale

### New rational View:

- Life improved by science/tech
- Nature as imperfect
- Productivity of enterprise

Concentrated animal feeding operation (CAFO): a farm in which animals are raised in confinement - that has over 1000 "animal units" confined for over 45 days a year. About 19,000 CAFO's in the US; they are government regulated.

- **Benefits of CAFO's:**
  - More efficient system to feed and house animals based on specialization (species/use/etc)
  - Low cost source of meat, milk, eggs due to efficient feeding and housing
  - Enhance local economy, increase employment
- **Effects of CAFO's:**
  - Waste production (manure management)
  - Environmental impacts (air quality)
  - Water quality

### 20th + 21st century - changing cultural values

- Anti-industrial Claims

- Public viewed the production systems as:
  - Cramped,unhealthy
  - No contact with nature
  - Injuries + deformities
  - Loss of human nature
- Recent changes in animal agriculture - one of the biggest changes in recent history as it relates to animal confinement practices has been the passing of Proposition 2 (2008) and most recently Proposition 12 (2018) by CA voters.
- Farm animal confinement initiative (2018)
  - Prop 12 seeks to: establish minimum space requirements based on square feet for calves raised for veal, breeding pigs, and egg-laying hens and
  - Ban the sale of (a) veal from calves, (b) pork from breeding pigs, and (c) eggs from hens when the animals are confined to areas below minimum square feet requirements
  - Prop 12 prohibited the confinement of calves raised for veal, breeding pigs, and egg-laying hens in areas below a specific number of sf, rather than restrictions based on animal behavior and movement
  - Beginning in 2020, prop 12 is set to ban the confinement of:
    - Calves in areas with less than 43sf of usable floor space per calf
    - Egg-laying hens (chickens, turkeys, ducks, geese, and guinea fowl) in areas less than 1sf of usable floor space per hen
  - Beginning in 2022, prop 12 is set to ban the confinement of:
    - Breeding pigs and their immediate offspring in areas with less than 24sf of usable floor space per pig
    - Egg-laying hens in areas other than indoor/outdoor cage-free housing systems based on the United Egg Producers' 2017 cage-free guidelines, which define cage-free housing as areas that provide 1-1.5sf of usable floor space per hen and allow hens to move around inside the area

### Important Organizations that Regulate Agriculture

#### United States Department of Agriculture (USDA)

- Responsible for developing and executing federal government policy on farming, agriculture, forestry, and food
- Promotes trade, production, food safety, and sustainability
- Certifies organic food, oversees meat inspections

#### US Food + Drug Administration (FDA)

- Protects and promotes public health through regulation and supervision of food safety (handling, processing, distribution), animal feeds, drugs, and supplements that can be given to animals

#### Food and Agriculture Organization of the United Nations (FAO)

- Leads international effort to defeat hunger