

# LONG EAR BEHAVIOR



Amy K. McLean,  
NC State University Equine Extension/ Animal Science  
Raleigh, NC  
March 19, 2013

## Ears are Everywhere!

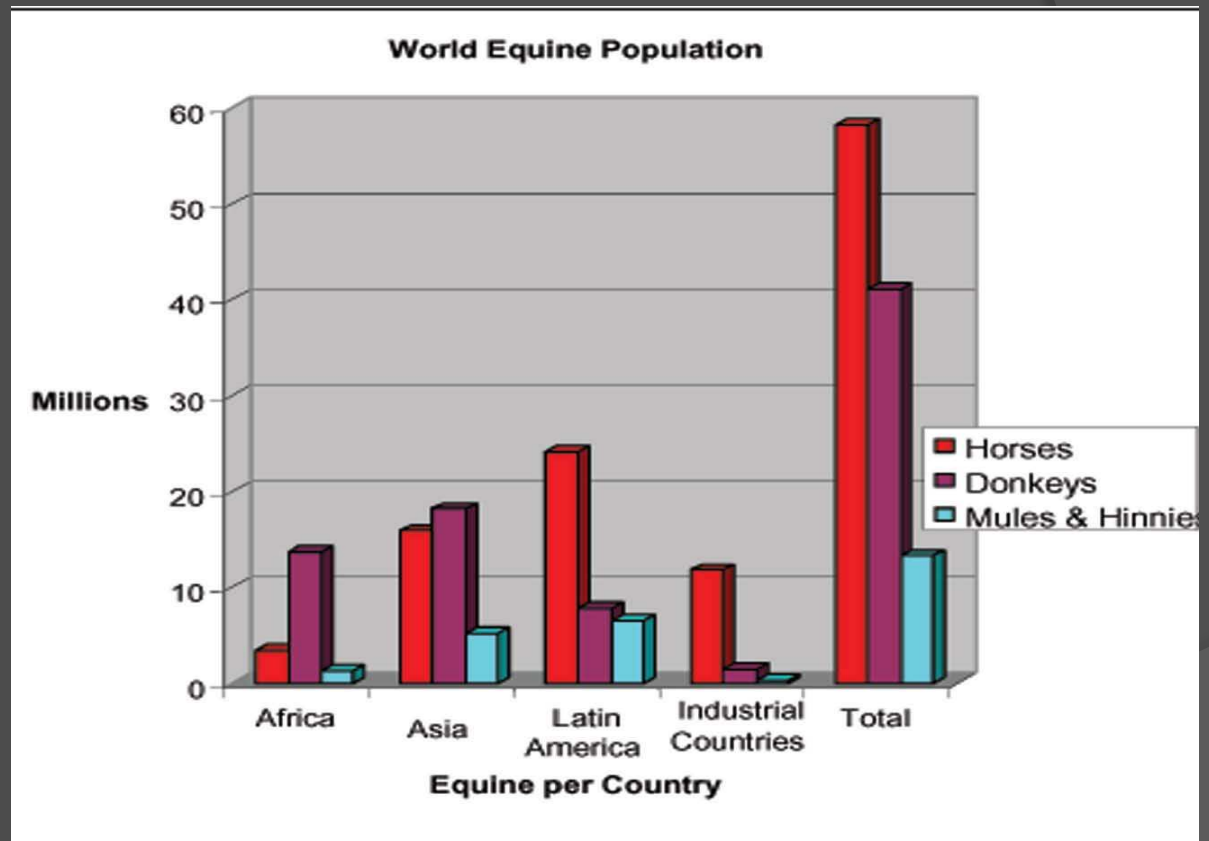


Worldwide there are approximately

- 55 million horses
- 44 million donkeys
- 13 million mules and hinnys
- Total 57 million equine with longears!

# Introduction – To donkeys & mules

- > 90% are working animals in developing regions of the world



FAO Statistics, 2002

# Longeared Breeds



- ◎ Asses, Mules, and Hinnies
  - Wild Asses
  - Domestic Donkeys (miniatures, standards, mammoths, some purebreeds)- *Equus asinus*
  - Mule (Sire-donkey, jack, and dam- horse (mare))
  - Hinny (Sire-horse, stallion, and dam-donkey (jenny))

# First Cloned Equine



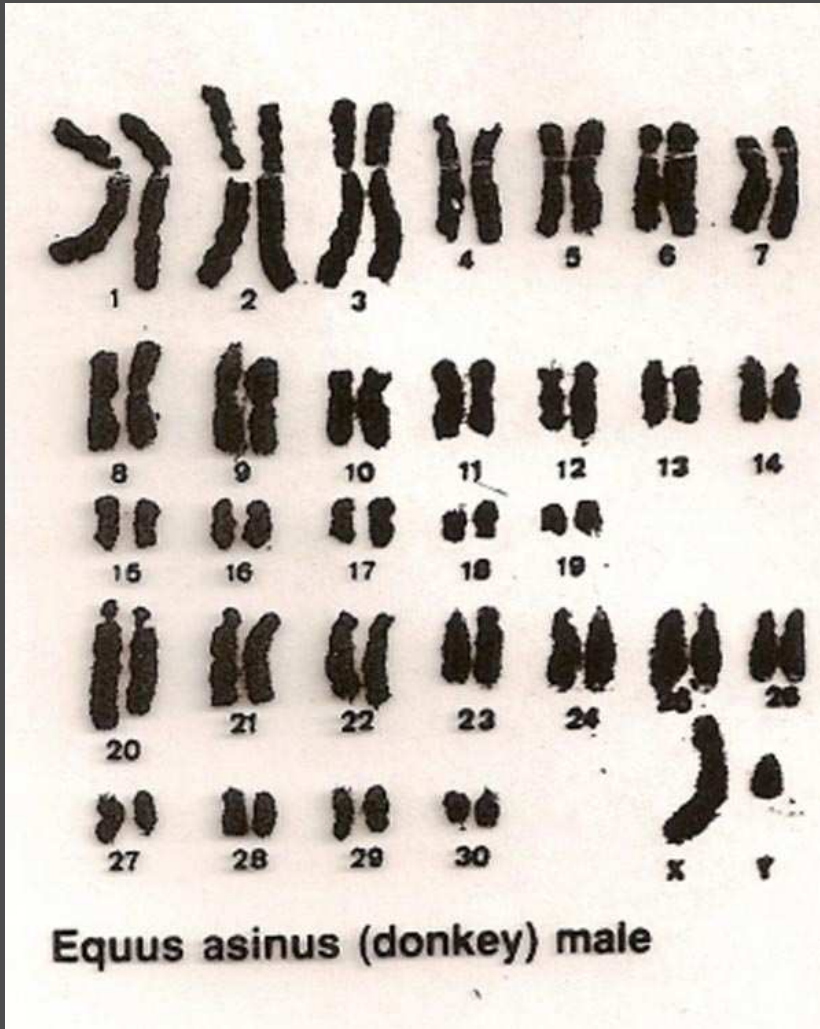
**Was a Mule!**

## Beast of Burdens

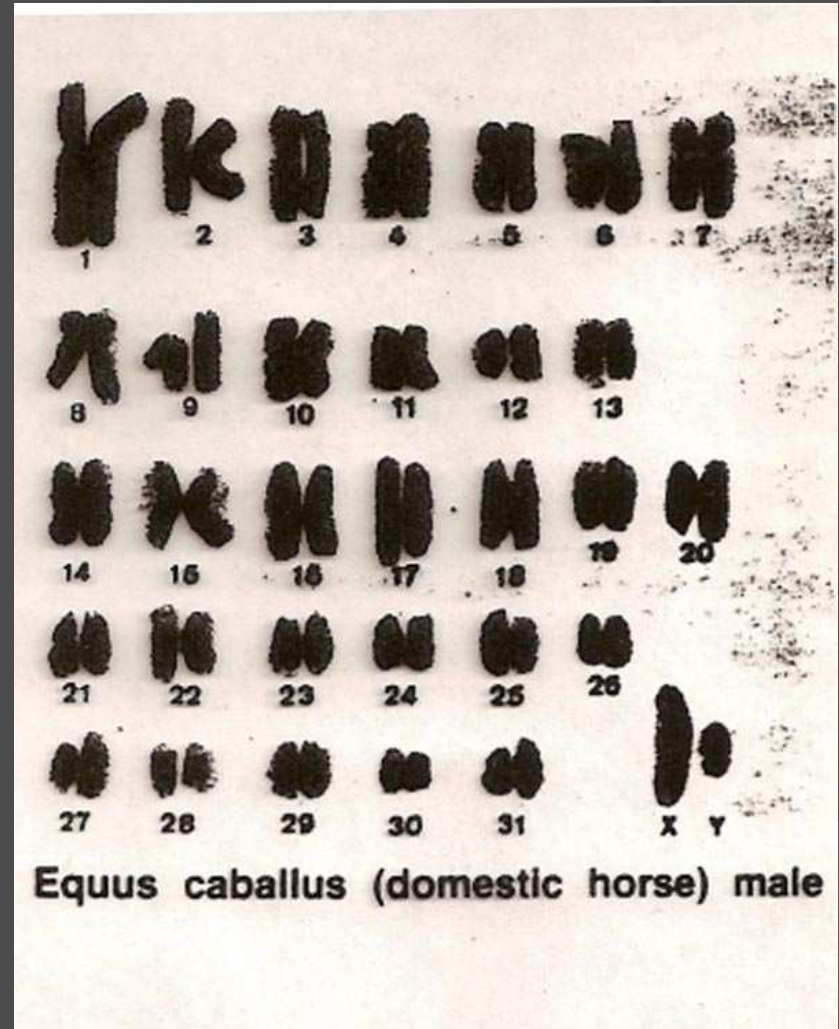




# Donkey vs. Horse



31 Chromosomes



32 Chromosomes



## Longear Lingo

- ◎ **Female donkey**
  - Jenny or Jennet
- ◎ **Male donkey (not castrated)**
  - Jack
- ◎ **Male donkey (castrated)**
  - a cut jack or gelding
- ◎ **Female mule/hinny**
  - mare mule or molly
- ◎ **Male mule/hinny**
  - horse mule or john

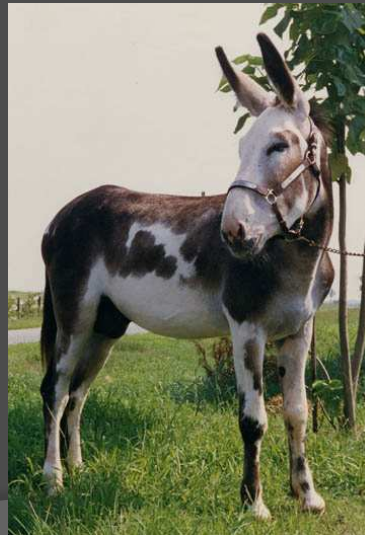


# Species Specifics- *Equus mulus*

- What's a mule?
  - A cross between a donkey and a horse
- Dam, or mother, is a mare (female horse, *Equus caballus*)
- Sire, or father, is a Jack (male donkey, *Equus asinus*)



+



=



# The opposite of a mule



+



=



Is a Hinny!

## Other longears

Zebra stallion + Jenny = Zedonk



# Other Longears



+



= Zorse



## Use of Equine:

- Food- Horse's were 1<sup>st</sup> hunted by mankind
  - Meat
  - Milk
- War
- Draft Purposes
  - Traction/Transportation
  - Cultivation/Harvest
- Recreation/Pleasure
  - Showing
  - Racing
  - Recreation



# Domestication of Equine

- ◎ 1<sup>st</sup> hunted for food
- ◎ Domesticated around 4000-3000 B.C.
- ◎ Donkeys 1<sup>st</sup> domesticated
- ◎ Domesticated in Mesopotamia
- ◎ Used for driving/packing
- ◎ Spread from Egypt to Asia



# Feeding Behavior



- ◉ Donkeys have been compared to small ruminants in their ability to digest poor quality feeds, meaning feeds/forages that are high in fiber
- ◉ Tend to think donkeys and mules can survive on less feed when compared to a horse
- ◉ Diets in developing countries are very high in fiber and low in protein and energy
- ◉ Donkeys often browse on a variety of plants including the bark of trees or wooden fences
- ◉ Not uncommon for donkeys to consume plants high in tannins



# Feeding Behavior

- Research has shown donkeys to have a slower gastrointestinal tract time, meaning what they eat stays in their digestive track longer compared to a horse, therefore they can maximize digestion and possibly nutrient absorption
- Donkeys continue to eat during times of dehydration
- Donkey and mules ability to dissipate heat aid to their possible need for less water when compared to a horse in drought type climates



# Grazing Behavior

- **Grazing**- preferred means of ingestion in adult equine
- **Browsing**- seeking out specific plants (more common in donkeys) adopted when grass or grazing source is scarce
- Donkeys tend to select (**browse**) for coarse grasses
  - *Will readily consume plants with tannins*
  - *Greater danger of selecting poisonous plants due to consuming a larger variety of plants*
- Horses prefer legumes (clover or alfalfa) and grasses
  - *Young plants (short grass) vs. more mature plants with greater fiber (stems)*
  - *Young plants or plants with increased leaf % increases intake/bite*
  - *Timothy and White Clover favorites*
  - *Bark, root, soil, acorns and aquatic plants*



# Donkey Communication

- More limited repertoire of vocalizations than horses
- 5 types of vocalization in donkeys
  1. Grunts
  2. Growls
  3. Sorts
  4. Whuffles
  5. Bray- used to attract other donkeys, stay in touch with 1 another and anticipating food

<http://www.youtube.com/watch?v=hMndb7eQDp8&feature=related>



# Social Behavior

- ◎ Donkeys prefer companions
  - Will mourn the death of a mate
- ◎ Become very attached to one another
- ◎ Will bond for life
- ◎ Socially territorial creatures versus harems
- ◎ Jacks are very vicious when fighting



# Grooming Behavior: Rolling

- Horses prefer to roll in bare or sandy spots or spots where others have rolled
- Very common in mules, zebras and donkeys
- May spread dirt on backs to decrease biting insects
- Almost always roll in a new place
- Could have a territorial reference



# Measuring Rank in Horse vs Donkey Groups

## ○ Measuring Rank-

- Easier in All Male Groups vs. natal bands
- Lack of consensus among studies in terms of social hierarchies
- Trend is to account for the posture/gestures of submission
- Can account for the best dominance at a site of limited resources
- That are NOT Man made (Ex. Supplying feed/grain) but counting the number of submissive responses among a herd at a watering hole or salt lick
- Measuring head responses, number of bites, and kicks.
- What about pawing?

## Specie Differences when 1<sup>st</sup> mtg

- <http://www.youtube.com/watch?v=Do71J-cwDMY&feature=related>
- <http://www.youtube.com/watch?v=YmTqC53hB18&NR=1>

## Reproductive Behavior: Gestation Length

- Pregnancy:
  - Gestation period of
    - mare ~ 11 months
    - 12 months for a donkey
    - Mare carrying a mule foal 11 ½ months
    - Jenny carrying a hinny foal 12-13 months
- Gestation period influenced by:
  - nutrition, towards the end of the pregnancy (higher plane of nutrition, foal earlier)
  - sex of the foal (fillies born 1-2 days earlier than colts)
  - Species of the foal (mule vs. donkey vs. hinny)



## Reproductive Behavior in Female Donkeys

- ⦿ Show less signs of estrus unless a jack is present
- ⦿ Jennies will mount other jennies when in estrus
- ⦿ Lower head and neck, pin ears back, hind legs splayed, tail raising and mouth clapping
- ⦿ Receptive behavior is pivotal in attracting a jack



# Reproductive Behavior in Female Donkeys

- Jennies stay very close to newborns, but gradually wean them by approaching less frequently around 10 months of age
- In domestic situations after weaning the foal and jenny still remain close in relationship
- Relationship can lead to separation anxiety and undesirable for owners



# Reproductive Behavior of Male Donkeys



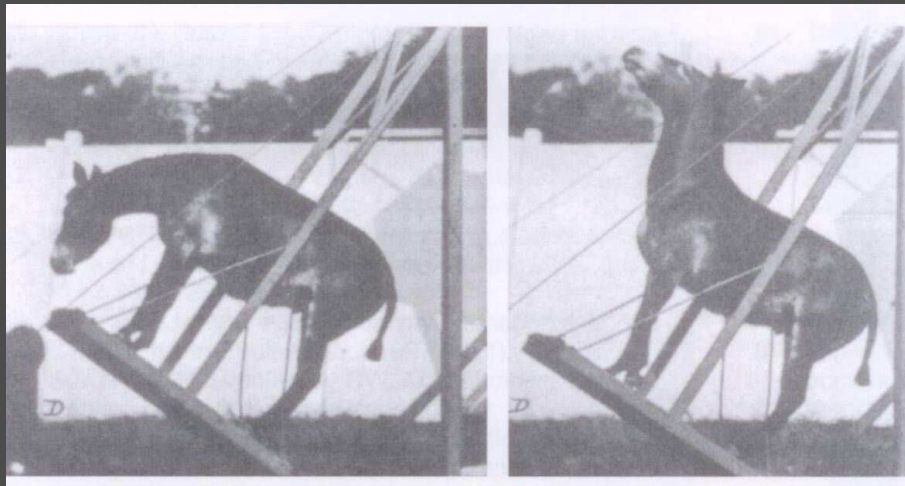
- Male donkeys found alone
- Courtship similar to stallions but within a territorial sociosexual structure
- More vocalization and posturing as a prelude to copulation and seem to rely on more overtly involvement of than female horse do
- Jacks are slower to mate
  - Presences of strangers or strong wind can increase procrastination for hours
  - Develop an erection after mounting, then remount
  - Jacks bred to mares are typically only bred to mares and not jennies

# Sexual Behavior of Male Donkeys

- ◉ Subordinate males are allowed to mate with jennies in the group after the dominate jack has mated
- ◉ <http://www.youtube.com/watch?v=NWzso422vyE>
- ◉ <http://www.youtube.com/watch?NR=1&v=EPUqfzonUIU>

# Learning Theory in Long Ears

- ◉ **Learning aka conditioning**: relatively a permanent change in the probability of a response occurring as a result of an experience  
*“update behavior according to circumstance”*
- ◉ **Stimulus**: any detectable change in an animal’s environment
- ◉ **Response**: any behavior or physiological event



**STIMULUS = RESPONSE = LEARNING**

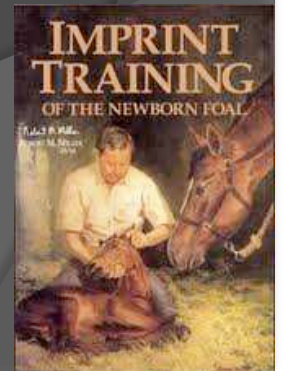
# Intelligence in Long Ears

- ◎ Ignore irrelevant stimuli vs. react to significant stimuli
- ◎ “*Discrimination*”
  - Recognizing stimuli and the ability to evaluate them
    - E.g. different sounds (feed cart vs wheel barrel for cleaning stalls)



# Imprinting and Socialization in Long Ears

- 1<sup>st</sup> 48 hours “following response is learnt”
  - Learns to follow its mom
  - Expose to stimuli early on, so readily accepted as normal later in life
  - Dr. Robert Miller advocates “ritualized habituation of the foal to common stimuli and then sensitization to selected “prompts”
  - PROMPTS- Performance, Related Stimuli
  - <http://www.youtube.com/watch?v=Mazllh8fJOw>



# Training and Behavior Modification

- ◎ *Habit*- between pressure, response, and timely release highly predictable
- ◎ Must release pressure = reward
  - Long Ears are very food driven, so once they respond often a treat is given, TIMING is EVERYTHING
- ◎ Horses are useful to humans based on their ability to learn
- ◎ Law of effect: “*whatever behavior immediately precedes reinforcement will be strengthened*”



# Reinforcers & Punishment

- **Reinforcers**- Response becomes more likely in the future, increases frequency of the particular behavior
  - *Merit of reinforcer measured by degree to which it makes the behavior more likely in the future*
  - *Food that is not normally fed and palatable good reinforcer*
  - *Doesn't work well on naïve horses due to neophobia*
  - *Water another reward*
- **Primary Reinforcer**- resource the animal evolved to seek (food, water, sex, play, liberty, companionship etc)
- **Secondary Reinforcer**- tactile stimulation- patting/scratching paired with a primary





# Reinforcers & Punishment

- ◎ **Negative Reinforcement** (applies pressure and then remove the pressure- take away)
  - Example: horse moves forward when you press your calf against its sides, pressure is released when the horse moves forward
  - Applying pressure on your reins, use of your leg, bit or spurs



# Reinforcers & Punishment

- ◎ *Positive Reinforcement*- addition of a reinforcer,
- ◎ Example: horse walks forward and receives food
  - Voice Commands
  - Difficult to deliver food immediately after horse offers desired behavior



# Reinforcement Schedules

- ⦿ Consistent in applying signals and granting rewards
- ⦿ Lack of consistent reinforcement = unpredictable behavior
- ⦿ Delayed behavior can decrease learning if Reinforcement APPLIED is not related to behavior
- ⦿ Must Retain the same results in multiple locations



# Memory

- ◎ **Memory**- retention or storage of information and therefore the basis for all higher forms of learning
  - *Length of time an animal can remember a specific signal of training or command can be taken as a measure of intelligence*
- ◎ **Sensory memory**- memory traces formed within the sensory areas of the CNS and receptor is activated, only 2% goes to permanent memory
- ◎ Long term memory storage- biochemical
- ◎ Any trauma to the head can short term memory
- ◎ Primary memory involves continuous neural activity
- ◎ State-dependent memory- go back to the same spot

# Influences on Learning

- ⦿ Differences among breeds?
  - Cold blooded horses learned a task quicker than hot or warm
  - Thoroughbreds may learn slower due to anxiety
  - How do donkeys and mules learn?
- ⦿ Breeds have been selected for certain uses
- ⦿ Breeds display different behaviors- based on different levels of biochemical?
- ⦿ Breeds learn differently- QH vs Thoroughbred vs. donkeys vs. mules
- ⦿ Whorl location



# Temperament

- Temperament tests may identify the best horses for certain jobs
- Emotionality/nervousness has an influence on behavior
- Avoidance learning tests reliable prediction for life and responses in reward learning tests
  - Stallions and geldings less timid than mares/fillies
  - Dominant horses harder to train?
  - Flightier donkeys & Mules are easier to train
- Certain breeds more prone to Stereotypies
  - Breeds that are managed more intensively
    - Standardbreds fewer than thoroughbreds, Arabians stall walk
    - Mules & donkeys tend to stall walk, paw, and vocalize when without a buddy



# Equine Mentality

- Horse have excellent memories but may not be able to reason
  - But can donkeys and mules reason?
  - Fight vs. Flight?
- Might not be able to reason based on their diet: grazing animals versus an animal that has to catch its food (example a cat hunting down a mouse)
  - What about a grazing animal that browses?
- Brain tissue that requires reasoning is more expensive to fuel
- Horse's brains allow for repetitive behavior patterns



# Form to Function

- **Confirmation may limit the quality of the training or level that can be obtained**
  - Example: Limited performance in jumpers and dressage horses include the wither:croup ratio , if wither is lower than croup, the animal has a hard time collecting himself and carrying weight on his hindquarters
- Horses that are croup high are more often found in race horses: Arabians, Thoroughbreds, plains zebra
- How are donkeys and mules made?
  - Generally the neck and back are equal in length but the hip





# Halter Training Method



# Traditional Malian Stick Method

