“Things to Consider Before Adding Another Livestock Enterprise”

Tony Nye & Ken Ford
OSU Extension
Clinton & Fayette Counties
Understanding Animal and Livestock Production
Matching Your Farm with the Animal

“It does not matter how slowly you go as long as you do not stop.”

— Confucius

CFAES
Legal considerations

- Zoning
- Special use permits
- Covenants, conditions and restrictions (CC&Rs)
- Local ordinances
Zoning

- Imposed by local government
- Agricultural, urban, rural, commercial
- Each zone has regulations on animals
- Some may require a permit
Covenants, conditions, and restrictions (CC&Rs)

- Some neighborhoods restrict animals through CC&Rs
Why have animals?
## Animal ownership

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxing</td>
<td>Time-consuming</td>
</tr>
<tr>
<td>Close to nature</td>
<td>Hard to get away</td>
</tr>
<tr>
<td>Teaches children skills</td>
<td>Costly</td>
</tr>
<tr>
<td>Fun family activity</td>
<td>Middle of night work</td>
</tr>
<tr>
<td>Supplemental income</td>
<td>May be dangerous</td>
</tr>
</tbody>
</table>
Balancing pros and cons
Is it worth it?
What does it cost to keep an animal?

- Initial costs
- Operational costs
Nutrient Needs

- Fiber (Forages)
- Protein
- Energy - can come from Fiber, Grains and Protein
- Vitamin
- Mineral
- Water
Forage production per acre

- Kentucky Bluegrass: 2 ton
- Orchard grass: 4 ton
- Alfalfa/Orchardgrass: 6 ton
## Digestive tract capacities

<table>
<thead>
<tr>
<th>Animal</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>94</td>
</tr>
<tr>
<td>Sheep or goat</td>
<td>12</td>
</tr>
<tr>
<td>Horse</td>
<td>56</td>
</tr>
<tr>
<td>Pig</td>
<td>7.2</td>
</tr>
<tr>
<td>Humans</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Digestive Systems

Cattle, Sheep and Goats—Ruminants
Prefer high forage diets of grass or legumes
Goats are browsers and not good grass eaters
Cattle and Sheep will eat grass and legumes
All diet changes must be gradual.
Feed Needs- Beef Cattle

• A Beef cow will consume about 5 ton of forages per year. Over one half a square bale per day.
• This cow would be expected to produce a 550 pound weaned calf.
• 550 – 1300 market animal would consume around 4500 pounds of feed. (most of it generally as grain)
## Beef cattle

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>1.5 gallons per each 100 pounds of body weight</td>
</tr>
<tr>
<td>Protein</td>
<td>8 to 16% of their diet</td>
</tr>
<tr>
<td>Energy</td>
<td>22 to 28 pounds of dry matter per day (or equivalent fresh material) with a fiber level of 30 to 70%</td>
</tr>
<tr>
<td>Vitamins</td>
<td>Generally must supplement A and E</td>
</tr>
<tr>
<td>Minerals</td>
<td>Ca to P ratios of 1.5:1 to 2:1; salt with trace minerals</td>
</tr>
<tr>
<td>Fats</td>
<td>Less than 5%; fats interfere with rumen function</td>
</tr>
</tbody>
</table>
Grass Fed Beef

• Lower in fat
• Higher in conjugated linoleic acid
• Environmentally friendly?
• E-coli?
Dairy

• Raising Bottle Calves—Need one 50 pound bag of milk replacer per calf. Wean after 6 weeks or longer.
• Replacement heifers
• Avoid Underfeeding and Overfeeding
## Dairy cattle

<table>
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</tr>
<tr>
<td>Protein</td>
<td>8 to 16% of their diet</td>
</tr>
<tr>
<td>Energy</td>
<td>1.4% to 2.4% of body weight, dry matter forage</td>
</tr>
<tr>
<td>Vitamins</td>
<td>Generally must supplement A and E</td>
</tr>
<tr>
<td>Minerals</td>
<td>Ca to P ratios of 1.5:1 to 2:1; salt with trace minerals; monitor copper, zinc, selenium, cobalt and iodine levels</td>
</tr>
<tr>
<td>Fats</td>
<td>Less than 5%; fats interfere with rumen function</td>
</tr>
</tbody>
</table>
Feed Needs--- Goats

• A 150 pound Dairy goat will consume around 3200 pounds of feed per year. Most as forages.

• Meat goats will consume less
# Meat goats

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>1 to 1.5 gallons per day average, double for lactating females</td>
</tr>
<tr>
<td>Protein</td>
<td>10 to 14% of their diet</td>
</tr>
<tr>
<td>Energy</td>
<td>2 to 4% of body weight. Need a minimum of 0.5 to 1.0 pound of roughage per day to keep rumen functioning. Can add grain as supplement.</td>
</tr>
<tr>
<td>Vitamins</td>
<td>May need to supplement A and E</td>
</tr>
<tr>
<td>Minerals</td>
<td>Ca to P ratios of 2:1; copper, zinc, and selenium are likely to be low</td>
</tr>
<tr>
<td>Fats</td>
<td>Less than 5%; fats interfere with rumen function</td>
</tr>
</tbody>
</table>
Sheep

• Prefer grass pastures with some forages mixed in.
• Lambs are usually finished on mostly grain diets
• Look out for a condition called Urinary calculi
# Sheep

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<th>Requirement</th>
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<tr>
<td>Vitamins</td>
<td>May need to supplement A and E</td>
</tr>
<tr>
<td>Minerals</td>
<td>Ca to P ratios of 2:1; zinc and selenium are likely to be low. Copper levels must be monitored as sheep are susceptible to copper toxicity.</td>
</tr>
<tr>
<td>Fats</td>
<td>Less than 5%; fats interfere with rumen function</td>
</tr>
</tbody>
</table>
Swine and Poultry

• Prefer high energy low fiber diets
• Diets will be high in protein
• Manure will be higher in Nitrogen
Feed Needs- Swine

- It takes about 10 **bushels of corn** and 90 pounds of Soybean meal to raise and finish a hog to market.
- Pasture pork---One acre of good pasture can accommodate up to 8 sows for a season.
- Under 100 pounds --- 15–30 pigs per acre
- Over 100 pounds----10-20 pigs per acre
## Swine

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water</strong></td>
<td>1 to 5 gallons per day</td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>12 to 18% of their diet</td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td>3 to 6% of body weight per day</td>
</tr>
<tr>
<td><strong>Vitamins</strong></td>
<td>Make vitamin C and some of the B vitamins; will need to supplement A, D, E, K, B-series, and other water soluble vitamins</td>
</tr>
<tr>
<td><strong>Minerals</strong></td>
<td>Sodium &amp; chloride (salt), calcium, phosphorus, copper, iron, zinc, iodine, selenium</td>
</tr>
</tbody>
</table>
Feed Needs - Poultry

- **Layers (Brown Egg Type)**

<table>
<thead>
<tr>
<th>Age</th>
<th>Total Amount of Feed (lbs)</th>
<th>Ration Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day old to 6 weeks</td>
<td>4</td>
<td>Starter</td>
</tr>
<tr>
<td>7-18 weeks</td>
<td>46</td>
<td>Grower</td>
</tr>
<tr>
<td>19-70 weeks</td>
<td>104</td>
<td>Layer</td>
</tr>
</tbody>
</table>

**Broilers (Meat Type)**

<table>
<thead>
<tr>
<th>Age</th>
<th>Total Amount of Feed (lbs)</th>
<th>Ration Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day old to 3 weeks</td>
<td>2</td>
<td>Starter</td>
</tr>
<tr>
<td>4-7 weeks</td>
<td>7</td>
<td>Finisher</td>
</tr>
</tbody>
</table>
Pasture Poultry
Pasture poultry

• Meat type poultry raised on pasture during warm weather.
• Chicks brooded and move to pasture at 3 weeks.
• Harvested at 8 weeks.
Free Range Eggs

• Yokes are darker and more flavorful.
• Many different types of housing-chicken tractors
• Predators
# Turkeys

<table>
<thead>
<tr>
<th>Age (weeks)</th>
<th>Weight</th>
<th>Cumulative Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1.65</td>
<td>2.3</td>
</tr>
<tr>
<td>8</td>
<td>6.2</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>11.6</td>
<td>24</td>
</tr>
<tr>
<td>16</td>
<td>16.5</td>
<td>41</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
<td>63</td>
</tr>
<tr>
<td>24</td>
<td>25</td>
<td>86</td>
</tr>
</tbody>
</table>
# Poultry

<table>
<thead>
<tr>
<th>Water</th>
<th>1 gallon per 10 chickens per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>16 to 22% of their diet</td>
</tr>
<tr>
<td>Energy</td>
<td>Needs vary with age; layer hens require 1/4 pound of complete ration per day. Chickens can not digest cellulose.</td>
</tr>
<tr>
<td>Vitamins</td>
<td>Need A, E, K, B series, C, choline, folic acid, biotin, pantothenic acid; most are included in balanced ration. Vitamin D is produced in the skin if the birds have access to sunlight.</td>
</tr>
<tr>
<td>Minerals</td>
<td>Ca:P ratios of 2:1 for meat birds and 8:1 for laying hens; also require salt and trace amounts of iodine, iron, manganese and zinc</td>
</tr>
</tbody>
</table>
Poultry: for meat or eggs?

- A laying ration provides two times more vitamin A, 2½ times more vitamin D and at least 3 times more calcium.
- A mature, lightweight bird will eat about 1/4 pound of feed daily, or 90 lbs/year, while producing about 240+ eggs each year.
- Broilers can gain 2 pounds for each pound of feed eaten.

L. Allen, Nev.
Horse and Rabbit

• Eat high fiber diets
• Have a unique fiber digesting unit called the Cecum
• Make feed changes slowly
<table>
<thead>
<tr>
<th>Animal</th>
<th>Yearly Repro Rate</th>
<th>Time to Next Gen.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swine</td>
<td>20</td>
<td>10 months</td>
</tr>
<tr>
<td>Cattle</td>
<td>1</td>
<td>2 years</td>
</tr>
<tr>
<td>Sheep and Goats</td>
<td>1-3</td>
<td>1 year</td>
</tr>
<tr>
<td>Horse</td>
<td>&lt; 1</td>
<td>3 years</td>
</tr>
<tr>
<td>Poultry</td>
<td>Many</td>
<td>7 months</td>
</tr>
</tbody>
</table>
# Reproduction terminology

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>MATURE FEMALE</th>
<th>YOUNG FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>COW</td>
<td>HEIFER</td>
</tr>
<tr>
<td>Sheep</td>
<td>EWE</td>
<td>EWE LAMB</td>
</tr>
<tr>
<td>Swine</td>
<td>SOW</td>
<td>GILT</td>
</tr>
<tr>
<td>Horse</td>
<td>MARE</td>
<td>FILLY</td>
</tr>
<tr>
<td>Birds</td>
<td>HEN</td>
<td>PULLET; POULT; CHICK</td>
</tr>
</tbody>
</table>
## Reproduction terminology

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>MATURE MALE</th>
<th>CASTRATE MALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>BULL</td>
<td>STEER</td>
</tr>
<tr>
<td>Sheep</td>
<td>RAM</td>
<td>WETHER</td>
</tr>
<tr>
<td>Swine</td>
<td>BOAR</td>
<td>BARROW</td>
</tr>
<tr>
<td>Horse</td>
<td>STALLION</td>
<td>GELDING</td>
</tr>
<tr>
<td>Birds</td>
<td>Rooster/cock/Tom</td>
<td>CAPON</td>
</tr>
</tbody>
</table>
Age at Breeding

- Heifer: 15 months
- Gilt: 7 months
- Horse: 15 months
- Ewe: 7 months
- Goat: 7 months
Gestation Length

- Cow 283 days
- Sow 114 days (3 months 3 weeks 3 days)
- Horse 336 days
- Ewe 148 days
- Goat 150 days
Number of Females per Male

- Cattle: 25
- Swine: 35
- Horse: 15
- Sheep: 30
- Goat: 30

Numbers are age related. Younger animals should be with less females.
Water

- Water needs will vary by animal size, reproductive status and weather
- Average animal needs:
  - Beef cow or horse – 12 to 15 gallons/day
  - Pig – 1 to 5 gallons/day
  - Llama – 2 to 5 gallons/day
  - Sheep or goat – 1 to 3 gallons/day
- These needs may double on hot days
Animal watering considerations

- Type and location of available water source(s)
- Site location and condition
- Type of grazing system
- Number of livestock
- Access to power source
- Pumping system
- Flexibility and portability
- Reliability and maintenance needs
- Temporary or seasonal water storage
- Cost, including maintenance
- Personal preference
Minerals

Supplement choices:

– Mineral block, tub
– Feed additive
– Loose or liquid

www.cgiar.org
Fencing considerations

- Balance looks, functionality and economics
- Safety of animals and people
- Installed or do-it-yourself
- Life expectancy
- Annual maintenance costs
Woven wire

• Cost
  – $2-$3/ft

• Pros
  – Readily available
  – Good for sheep
  – Add 1 to 2 strands of barbed wire at top for cattle

• Cons
  – Expensive
  – Requires routine maintenance
4- to 10-strand smooth wire

• Cost
  – $1–$2/ ft, depending on number of wires

• Pros
  – 4- to 5-strand good for horses
  – 10-strand will contain all large livestock and exclude large wildlife
  – Durable
  – Can be electrified

• Cons
  – Expensive
  – Requires routine maintenance

www.kiwifence.com
4-strand barbed wire

• Cost
  – Varies

• Pros
  – Low cost
  – Easy to install
  – Fairly low maintenance

• Cons
  – Dangerous to people, livestock and wildlife
  – Not suitable for horses
  – Not useful for small animals
  – Can be damaged by large wildlife
Electric ribbon

- **Cost**
  - 1½ inch ribbon $.15/ft
  - Wood post $8-$12
  - T-posts 6’ $7-$8
  - Insulators $.25-$1.50 each

- **Pros**
  - Versatile
  - Easy to install and modify
  - Can be used to make existing fence more effective
  - Easier to see than other types of electric fencing

- **Cons**
  - Cost and availability of electricity or solar source
  - Maintenance
  - Not a good choice for a permanent fence
What kind of shelter do my animals need?

What kind of shelter do I want for my animals?
Considerations for shelter

• Needs to provide adequate shelter for local weather conditions
  – summer
  – winter
• Durable
• Reasonable maintenance costs
• Visually appealing
• COSTS
Shelter

• Can be simple or elaborate
• Costs vary widely
Predators

• Cattle- Coyote on claves
• Swine –Coyote on newborn
• Horse- Coyote on newborn
• Goats- Coyote on newborn
• Sheep- Dogs, Coyote
• Poultry- Raccoon, skunk, owl, opossum
  • NEW PEST – Black Vulture
Providing nutrition year-round

- Purchase feed
- Improve pasture production
- Rotational grazing
- Grow feed instead of, or in addition to, forage
Rotational Grazing
Which pasture would you like to graze?

This or... this?
Relative Feed Cost Comparison

- Grazing: 1 cent per lb
- Grass Silage: 4.5 cent per lb
- Corn Silage: 7 cent per lb
- Grass Hay: 9 cent per lb
Pasture Considerations

• Grasses
• Legumes
• Different animals need different types of pastures
• Rotational Grazing
<table>
<thead>
<tr>
<th>Animal Type</th>
<th>Optimal Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow/calf</td>
<td>3-7 days</td>
</tr>
<tr>
<td>Stockers</td>
<td>1-3 days</td>
</tr>
<tr>
<td>Dairy cow</td>
<td>0.5-1 day</td>
</tr>
<tr>
<td>Ewe/lamb</td>
<td>2-5 days</td>
</tr>
<tr>
<td>Feeder lambs</td>
<td>1-3 days</td>
</tr>
<tr>
<td>Horses</td>
<td>5-7 days</td>
</tr>
</tbody>
</table>
Nutrition and Health

• Well-fed animals in good condition are healthier and more resistant to disease

• Two categories of disease:
  – **Infectious** - caused by parasites, fungi, bacteria, viruses, protozoa
  – **Noninfectious** – results from issues such as nutritional deficiencies, metabolic disorders, trauma, congenital defects & toxic materials
Animal ID Methods

- Tattoo
- Electronic ID Tags
- Leg Bands
- Brands
- Retinal Scan
Preventive healthcare for animals

- Consult a local veterinarian
- Maintain schedules of vaccinations
- Keep complete records
- Quarantine new animals
What about vaccinations?

- Consult a local veterinarian for advice
- Follow state or local regulations
- Take into account the prevalence of disease in your area
- Consider the effectiveness of the vaccine or bacterin
- Cost of the vaccine
- Adverse reactions
Adherence to drug labels

- Follow veterinarian recommendations
- Follow label requirements
- Make sure drug is species-specific
- Keep records
Injection Site

New Injection Zone (Blue)

Previous Zone
Injection Site Lesion
What to look for in a Healthy Animal

- Shiny coat
- Bright eyes
- Good breathing
- Body condition
- Sound feet and legs
- Genetics
- Manure consistency
Bloat

• Problem in Ruminants such as Cattle, Sheep and Goats
• Usually seen in pastures with clover and alfalfa.
• Caused by fermenting very digestible forages
• Gas causes pressure on lungs and heart
• Can kill quickly (less than one hour)
Bloat

• Never turn a ruminant animal into an area for the first time if there is dew or moisture on the grass.
• Pastures with 50% grass will less likely have a problem.
• Use Bloat Guard blocks (Poloxolene)
• Never turn a hungry animal into a new pasture
Additional preventive care

• Parasites
  – Internal
  – External
## Parasites...beef as an example

<table>
<thead>
<tr>
<th></th>
<th>Worms</th>
<th>Lice/Mange</th>
<th>Grubs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td>Diarrhea</td>
<td>Scratching</td>
<td>Look like marbles under the skin on animal’s back</td>
</tr>
<tr>
<td></td>
<td>Blood in urine</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight loss</td>
<td>Loss of blood</td>
<td></td>
</tr>
<tr>
<td><strong>How it spreads to other animals</strong></td>
<td>Eggs in manure spread to grass or eggs in drinking water</td>
<td>Direct contact with other animals</td>
<td>Heel fly lays eggs on lower legs</td>
</tr>
<tr>
<td><strong>Treatment or control measures</strong></td>
<td>Dewormers: bolus, paste, drenches and injectables</td>
<td>Spray, clips, liquid pour-on dusts, rubbers, injectables</td>
<td>Sprays, dips, liquid pour-on, injections</td>
</tr>
</tbody>
</table>
Flies

• Bother animal
• Reduce growth
• Feed on blood
• Carry disease “Pink Eye”
Fly Control

• Pour on
• Sprays
• Back rubs
• Ear tags
• Sanitation
Deworming

- Parasitic nematodes
- Species variation—cattle worms do not affect sheep
- Make animals anemic
Parasite resistance to Anthelmintics

- A growing problem
- Worldwide and in the U.S.
- This is a real threat to the small ruminant industries
What Causes Resistance To Dewormers???

• Frequent Treatments
  – 3 treatments per year
• Treating and moving to clean pasture
• Under dosing
• Treating when few larvae are on the pasture
  • Treating all animals at same time
Do your animals have access to any of these?

- Toxic plants
- Toxic bedding
- Moldy hay or grain
- Trash
- Lawn clippings
- Pesticides

www.aphis.usda.gov
Some plants may be toxic

- Some are poisonous in some seasons only
- Some affect certain species and not others
- Most cause specific physiological symptoms

Poison hemlock

http://cal.vet.upenn.edu
Dispose of dead animals properly

http://defendingfarmanimals
Dead Animal Disposal

No person owning or caring for any animal that has died from any cause shall allow the body to lie about his premises. Any animal body shall be disposed of by such person within twenty-four (24) hours after knowledge of death so as not to produce a nuisance. Disposal must be by one (1) of the following methods:

- Burial
- Incineration
- Composting
Burial

The animal must be buried the owner's premises, to such a depth that every part of the animal's body is at least four (4) feet below the natural surface of the ground and every part of the animal's body is covered with at least four (4) feet of earth in addition to any other material that may be used as cover.

Ordinances. No person may bury the body of any animal within the corporate limits of any city or town, where the same is prohibited by law or ordinance.

Check with your local plan commission office to determine your local ordinances!
Incineration

Thorough and complete incineration according to standards established by an appropriate governmental agency.

In this case, the appropriate governmental agency is the Indiana Department of Environmental Management. For more information call the IDEM Office of Agriculture Relations at 317-232-8587.
Composting

Obtain a permit if manure will be used in the process through IDEM. Call the IDEM Office of Agriculture Relations.

Cover the carcasses with one to two feet of damp base material.

Maintaining adequate coverage of carcasses is extremely important!
Culling

- Eyes
- Mouth
- Feet and Legs
- Udders
- Poor Body Score
- Disposition
- Reproduction
Responsible Culling

- Examine the eyes
- Ocular neoplasia = Cancer eye
- Pink eye
Responsible Culling – Mouths
4 on each side
Responsible Culling - Mouthing
Responsible Culling – Feet and Legs

- Lameness is a real problem
- Look at the whole leg
Responsible Culling – Feet and Legs

- Screw Claw

Source: Zimpro Corporation
Eden Prairie, MN

CFAES
Responsible Culling - Udders

- Good udder = good calf
- Big, long, pendulous teats
Responsible Culling - BCS
Responsible Culling - BCS
Responsible Culling - Disposition

John doesn't cull cows with bad disposition. He just dresses for the occasion!
Responsible Culling - Pregnancy

• Pregnancy Check your animals

• Open animals over the winter are expensive

• $350 on average for a cow.
What environmental impacts can animals cause?
Impacts from mouths

• Overgrazing plants can weaken their root structure; plants don’t recover
• Pasture productivity decreases
• Soil erosion increases
Impacts from bodies

• Objects in the pasture are damaged
  – Trees, posts, irrigation works, fences
• Weed seeds and pests are transported
Impact on Woods
Good manure management

• Keeps livestock healthy
• Returns nutrients to the soil
• Improves pastures and gardens
• Protects the environment
How much manure do animals produce?

How much manure do you think two horses kept in a small stable for three months in the winter will produce?
**Tons of horse manure!**

- 2 horses, 1,000 pounds each
  - WEIGHT: 50 lbs/day $\times$ 2 = 100 pounds
  - VOLUME: 0.81 cubic feet/day

- WEIGHT: 50 lbs/day $\times$ 30 days/month $\times$ 3 months = 4,500 pounds of manure

- VOLUME: 0.81 cu ft/day $\times$ 30 days/month $\times$ 3 months = 73 cubic feet of manure
# Nutrient value of manures

<table>
<thead>
<tr>
<th>Animal</th>
<th>N (lbs/ton)</th>
<th>P$_2$O$_5$ (lbs/ton)</th>
<th>K$_2$O (lbs/ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>11.3</td>
<td>8.4</td>
<td>9.5</td>
</tr>
<tr>
<td>Chicken</td>
<td>27.3</td>
<td>23.5</td>
<td>13.2</td>
</tr>
<tr>
<td>Goat</td>
<td>22.0</td>
<td>5.4</td>
<td>15.1</td>
</tr>
<tr>
<td>Horse</td>
<td>12.1</td>
<td>4.6</td>
<td>9.0</td>
</tr>
<tr>
<td>Sheep</td>
<td>22.5</td>
<td>7.6</td>
<td>19.5</td>
</tr>
</tbody>
</table>
Manure can be a resource

• Livestock remove nutrients from land while grazing
• Returning manure to soil promotes soil fertility and plant growth
• Important nutrients
  – Nitrogen (N)
  – Potassium (K or K₂O)
  – Phosphorus (P₂O₅)
Can I use all my manure?

- How much will you have?
- Where can you safely store or compost it?
- Where can you safely incorporate it in or on your property?

whatcom.wsu.edu/ag/compost
Wellbeing

Producer-originated animal suffering:

• **Neglect** -- failing to provide an animal with a vital requirement such as food, water, or shelter.

• **Abuse** -- striking or willfully harming an animal with a club or instrument of harm.
Safety - Animals to watch

- New moms
- Males
- Scared or cornered
- Separated from the herd
- Animals raised as pets
Safety Parts to watch

- Cattle: Mostly back and some front
- Horse: Back and front
- Sheep: Front
- Goat: Front
- Horse: Back and front
- Poultry: Pecking, pinching, and flopping
Flight zone
Breeds

• Within a species different breeds have desirable characteristics.
• In cattle Holstein produce milk and Angus produce meat.
• You need to ask,”What does this breed do for me.”
• Miniature's
Purebred

• Pure strains that when crossed produce vigorous offspring;
• Cost more and can sell for more
• Registered
Crossbreeding

- Increases productivity in beef
- Seldom done in dairy
- Advantages seen in meat goats – worm resistance
- Beneficial in sheep and pigs
It's QUESTION TIME!!

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