Livestock Nutrition, Feeding, and Pasture Workshop

15th Alaska Sustainable Agriculture Conference

February 22, 2020; Anchorage, Alaska

Michael Fisher, Colorado State University Extension – Pueblo County Extension Director

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Nutrient Tables

- **DMI** stand for Dry Matter Intake. It is how much feed an animal eats if there was no moisture in the feed. Allows you to compare the nutrient level of two feeds.
- **TDN** stands for Total Digestible Nutrients and is a measurement for how much energy a feed provides.
- **CP** stands for Crude Protein and is the measurement of how much protein a feed provides.

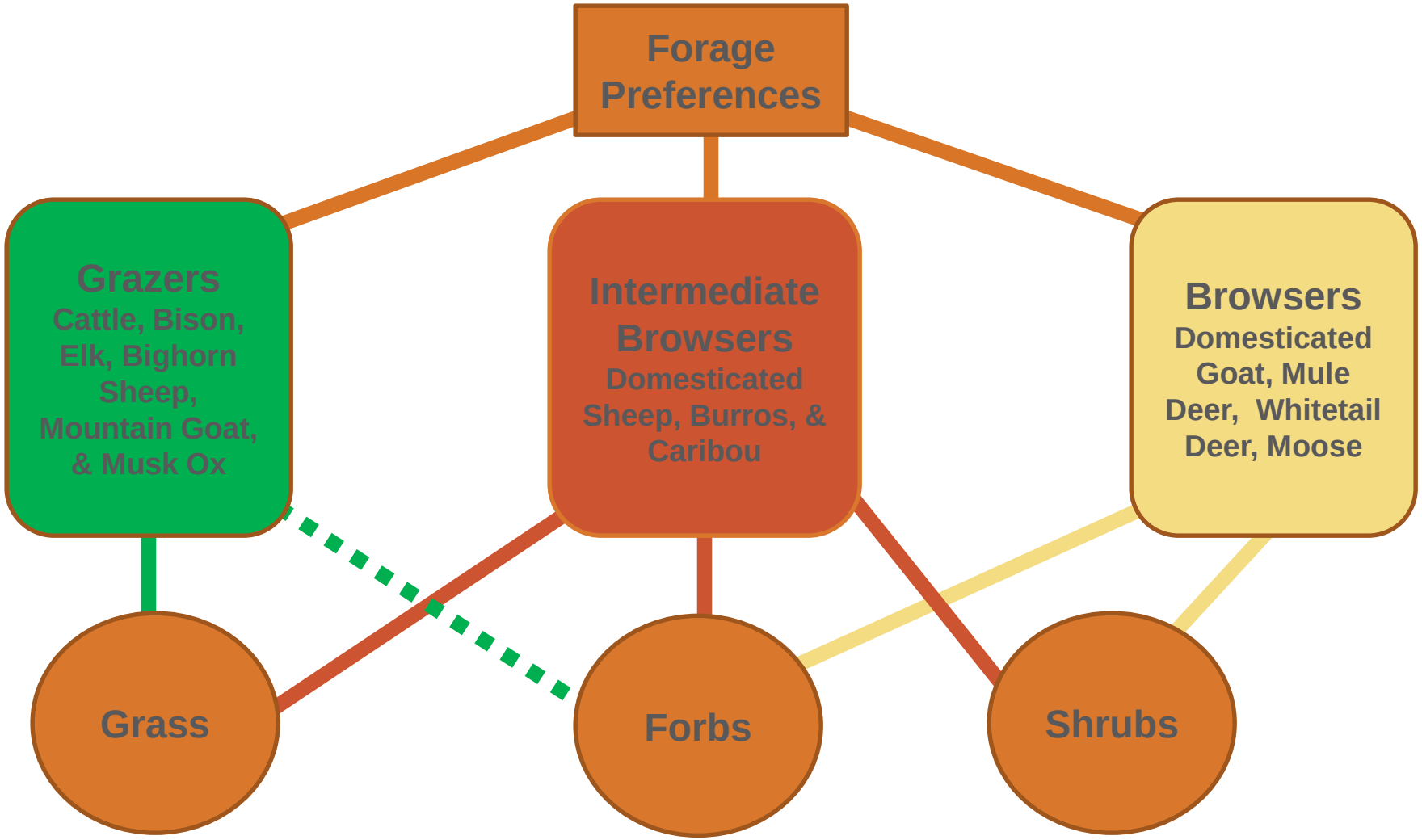
Nutrition Basic Definitions

- **Protein** – (Made of Amino Acids) Makes muscle and bone. Essential for body growth.
- **Energy** – Metabolism function, activity, heat regulation, and helps put on fat/marbling.
- **Vitamins and Minerals** – Essential for bodily functions, quality hair coat, health, growth. Be sure you have a balanced feed.
- **Roughage** – Important for proper ruminant digestion.
    - » Grass forages = energy.
    - » Legume forages = protein & energy.

Think of It This Way…

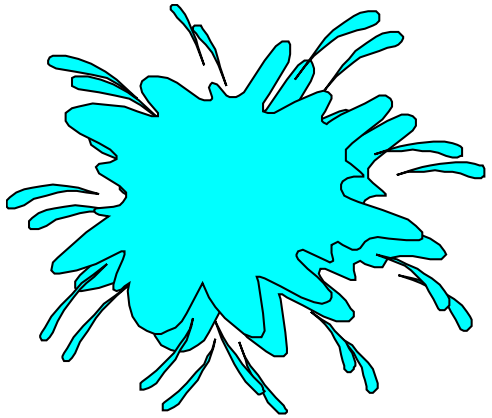
- **Protein** makes them grow.
- **Energy (Carbohydrates or Fats)** makes them finish and put on fat.
- **Roughages** aid in rumen health and gives them that full deep bodied look.
- **Minerals & Vitamins** can help them have a good fleece or hair, stay healthy, and grow without deformities.

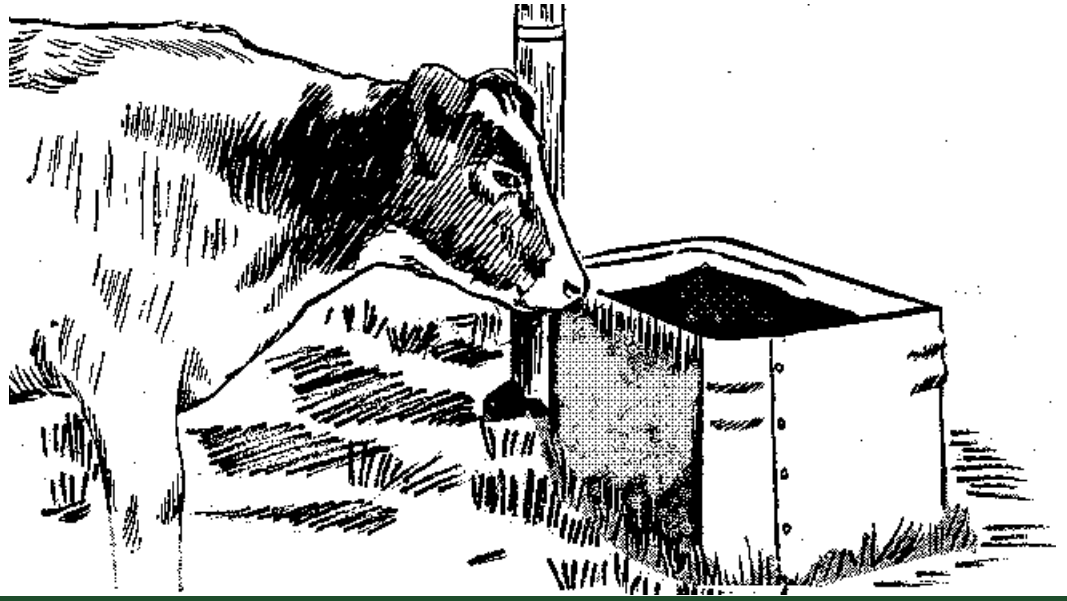
Forage Preferences



Feeding Livestock

What is the most important (first limiting) nutrient for your animal?



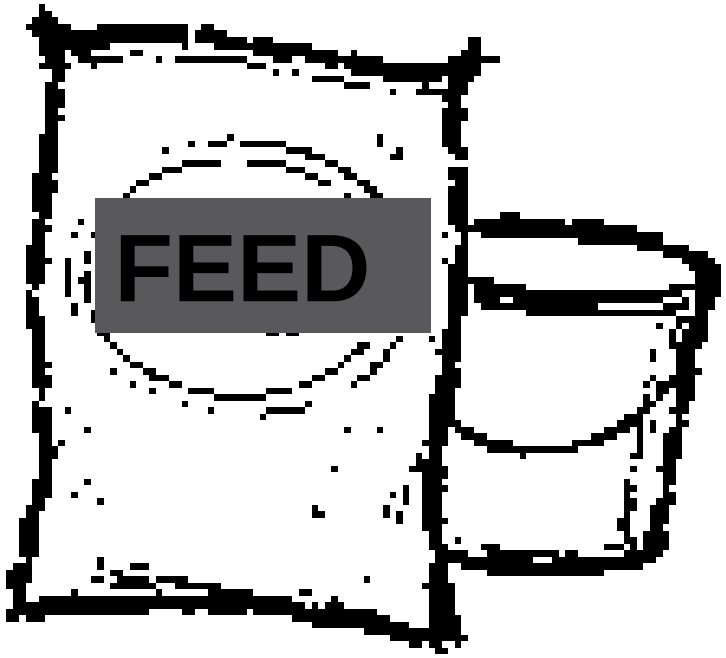


Feeding Livestock

- Clean feed
- Avoid dusty, moldy, spoiled feed
- Be sure feed pan or trough is clean each feeding

Nutrition

- Protein
- Energy
  - Carbohydrates
  - Fats
- Roughage
- Minerals
- Vitamins



Basic Ruminant Nutrition

(Ruminant Digestive Physiology Refresher)

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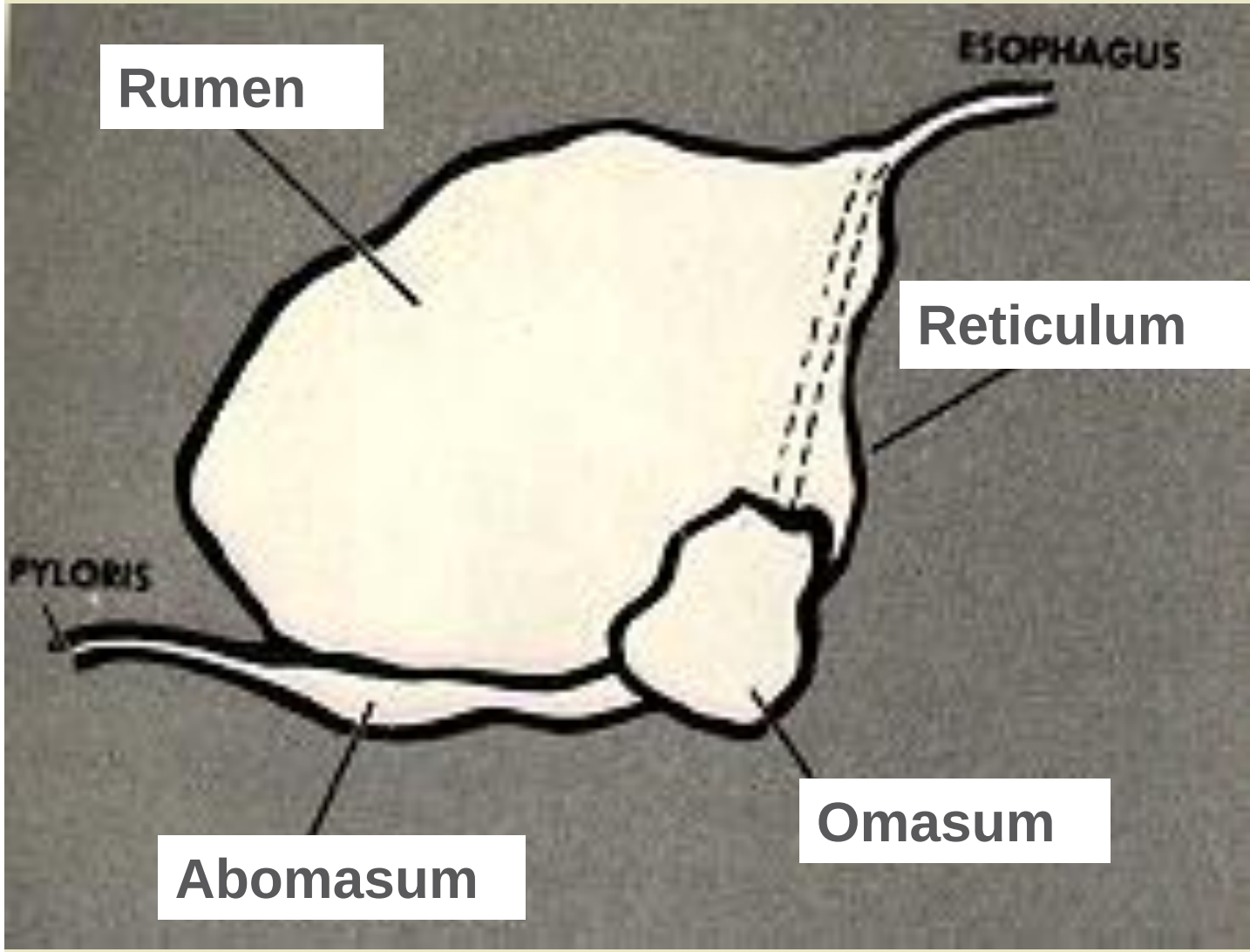
We Should Understand How The Rumen Works…

The Four-Chambered Stomach

- Rumen – First and largest chamber.
  - Feed is broken down by bacteria, protozoa, & yeasts. (Collectively called microorganisms.)
- Reticulum – Second chamber.
  - Catches foreign objects that may cause harm.
- Omasum – Third chamber.
  - Takes water out of the feedstuffs before entering the next chamber.
- Abomasum – Fourth chamber.
  - Acts like a monogastric stomach: gastric acids aid in digestion of proteins.

The Four-Chambered Stomach System



Information Related to Goat Nutrition

Photo by my Dad, Dwight Fisher. His goat in my Mom’s flower pot. Mom didn’t find it as humorous as Dad did.

Goat Mineral Issues

- Salt
- Calcium:Phosphorus Ratio
  - Ranges from 1.4:1 to 2.5:1
  - Maintains bone strength
  - Blood clotting
  - Prevents urinary calculi
- Iodine
  - Can easily be deficient.
    - Causes goiters
  - Best when fed

Goat Mineral Issues

- Selenium
  - Dependent on local selenium levels in soil & forage
  - Deficiency
    - White Muscle Disease
      - (See picture)
    - Poor growth/unthrifty
    - Scouring
    - Doe infertility
- Iron
  - Foraging goats generally have enough iron in diet
  - Internal parasite load can throw off iron balance
    - Creates anemia
    - Consider Famacha® monitoring for parasites

Goat Mineral Issues

- Copper
  - Goats need significant copper
    - Do **NOT** feed goat mineral to sheep, it can kill sheep because the copper levels are too high for sheep
  - Deficiency leads to
    - Hair loss
    - Abortion
    - Bone Fractures
    - Reduced milk production
    - Weight loss
  - Molybdenum : copper interaction
    - More than 3 ppm Mo in the diet can tie up copper
      - Creates an artificial copper deficiency

Information Related to Sheep Nutrition

Photo by Michael Fisher. Sheep resting along the path to the Rock of Cashel: Cashel, Ireland.

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Lamb Mineral Issues

- Salt
  - 7 to 11 grams per day
- Calcium:Phosphorus Ratio
  - 2:1
  - Maintains bone strength
  - Blood clotting
  - Prevents urinary calculi
- Iodine
  - Can easily be deficient.
  - Best when fed

Lamb Mineral Issues

- Copper
  - Required in diet but in very limited amounts
  - Sheep are very susceptible to copper toxicity
    - Do **NOT** feed cattle or goat mineral to sheep
- Selenium
  - Dependent on local selenium levels in soil & forage
  - Deficiency
    - White Muscle Disease
      - (See picture)
    - Poor growth/unthrifty
    - Poor wool production
    - Scouring
    - Ewe infertility

What To Feed

- That depends……
  - What is available?
  - What can you get a hold of?
  - Are you going to buy a feed ration?
  - Are you going to make a feed ration?

Percentages & Amounts

- Vary with growth stage
- Consult your feed dealer
- See chapter 4 of Sheep Resource Handbook

Common Energy Lamb Feeds

- Corn
- Milo
- Whole grain barley
- Whole grain oats
- Beet Pulp
- Hay & hay cubes
- Wheat
- Wheat middlings
- Molasses
- Whole grain rye

Common Protein Lamb Feeds

- Cottonseed meal
  - CSM
- Soybean meal
  - SBM
- Urea
  - Non-protein nitrogen
- Fish meal
- Dehydrated alfalfa meal pellets
  - Dehy
- Linseed meal
- Alfalfa hay

Feeding

- Roughage
  - Minimum of 1 LB of hay per day – aids in digestion
- First few days
  - Feed only hay and/or grass while lamb(s) adjust to new surroundings
    - Exception is if you have prior feed available

Lamb Feeding

- Starting concentrate diet
  - ¼ to ½ LB per day
  - Allow 15 to 20 minutes to eat concentrate, then remove
    - Next feeding subtract amount that remained
    - You want them to clean up the feed allowed
- Gradually increase grain amount until reaching 2 LBS per day
  - Should take about two weeks

Lamb Feeding

- Growing ration
  - 16 to 18% CP
  - Feed until the lamb weighs 70 to 85 LBS
- Finishing ration
  - 12 to 14%
  - Make step up from growing ration to finishing ration gradually.
    - Every few days add some finisher ration and remove some grower ration.

Step Up a Ration

- As lambs grow, you will want to increase and possibly change their ration.
- **NEVER MAKE A RATION CHANGE ALL AT ONE TIME.** Step the ration up over a period of time. (Two weeks to step up a ration is a good rule of thumb.)
- Many producers will have two or three rations during the feeding period.

Feeding (Youth Exhibitors)

- How much do you feed?
  - Determine days from purchase to show.
    - (Hypothetical Example)
    - Buy at 55 LBS
    - Show goal 120 LBS
    - Needs to gain 65 LBS
    - Assume 80 days to show = Needs to gain 0.81 LBS/day
  - Lambs & feed vary
    - Expect between 2 & 5 LBS of feed per ¾ to 1 LB of gain.
    - Younger lamb will not eat as much as an older lamb.
    - Always feed fresh & clean feed.

Management Factors Influencing Growth

- Space requirements
  - Barn
    - Mature
      - 10 to 12 sq. ft per bred ewe
      - 15 to 20 sq. ft per ewe/lamb pair
    - Lambs
      - 10 sq. ft per large lamb
      - 6 sq. ft per small lamb
  - Outside pen
    - 20 to 25 sq. ft per bred ewe or ewe/lamb pair
  - Pasture
    - ¼ acre

Management Factors Influencing Growth

- Bunk space
  - Barn
    - Mature
      - 18 linear inches for hand feeding
      - 8 to 12 linear inches for self feeder
    - Lambs
      - 8 to 12 linear inches for hand feeding
      - 4 to 6 linear inches for self feeder
  - Lambing pens (jug)
    - 4x6 feet
    - 5x5 feet

Management Factors Influencing Growth

- Altitude
  - Like people, some sheep can suffer from altitude issues
    - Altitude sickness
    - Adaptation problems
      - Bring these lambs to altitude gradually
    - Stressed breathing
    - Cardiac strain
    - Lowered appetite
    - Dehydration
    - Pulmonary edema (Brisket Disease)

Management Factors Influencing Growth

- Water – 2 to 4 quarts per day
  - Weather dependent
- If they don’t drink, feed intake drops significantly
  - Needs to be clean
  - Needs to be fresh
  - Needs to be cool
    - Garden hoses in sun will heat up water & put lambs off water
      - Shade or bury hoses used for water supply
  - Switching to chlorinated water may cause lambs to quit drinking
  - Stray voltage

Management Factors Influencing Growth

- Lambs can contract a pox virus called soremouth.
  - Very common & very contagious
  - Causes ulcers in the mouth
  - Infected lambs will limit or eliminate their feed intake
- Lambs are prone to foot problems
  - Soremouth
    - Causes blisters at top of the hoof
  - Foot rot & foot scald
  - Overgrown hooves
  - Founder

Management Factors Influencing Growth

- Sheep are extremely gregarious animals
  - They don’t like to be penned by themselves

- Two or more lambs together will gain weight much better than a lone lamb

Management Factors Influencing Growth

(Youth Exhibitors)

- Exercise
  - Your lambs should be exercised frequently
  - Some exhibitors walk lambs a minimum of 400 yards per day
  - Some exhibitors will plan on 20 to 30 minutes of walking
  - Trains your lambs to work with you
  - Prepares them for a long showmanship class
  - Keeps them active & more likely to walk to the feedbunk

Management Tips

- Sleeping area should be cool, dry, & draft free
- Sawdust/wood shavings for bedding
  - They will eat straw bedding & get a “hay belly”
- Locate water in a well drained location
- Summer shade needed
- Need fresh air when in confinement

Information Related to Cattle Nutrition

Photo by Michael Fisher. Cows grazing in Custer County, Colorado.

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Feeding Calves

- Calves will eat 2.5% to 3% of their body weight.
- A 500 pound calf will eat approximately 13 pounds of concentrate feed when on **FULL FEED**.
- Increase slowly when starting them on feed to prevent bloat.

Percentages

- **Protein levels** should range between 11% and 13%
- **Fat levels** should be between 2% and 4%
- **Roughages** – as much as they will eat and still clean their grain up

Estimating Weight – Without a Scale

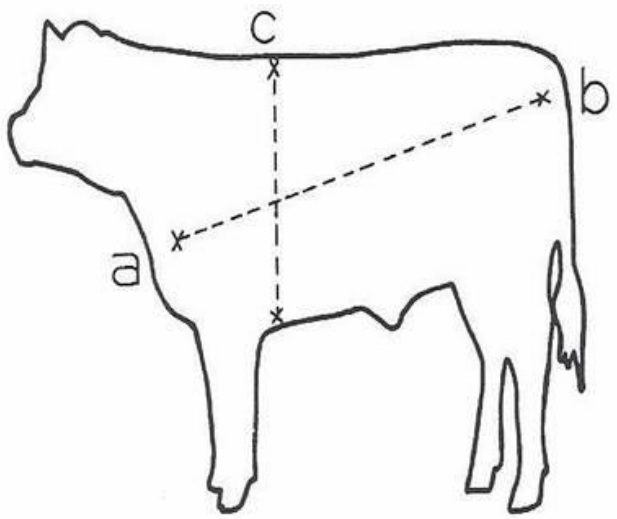

Fig. VI-3. How and where to measure beef cattle.

Example of a beef animal. *Assume that the heart girth measures 76 in. and the body length, 66 in. How much does the animal weigh?*

76 × 76 = 5,776
5,776 × 66 = 381,216
381,216 ÷ 300 = 1,270 lb

BEEF CATTLE WEIGHTS

Here is how to do it:

Step 1. Measure the circumference (heart girth), from a point slightly behind the shoulder blade, thence down over the foreribs and under the body, behind the elbow (distance C of Fig. VI-3).

Step 2. Measure the length of body, from the point of the shoulder to the point of the rump (pinbone), in inches (distance A-B of Fig. VI-3).

Step 3. Take the values obtained in Steps 1 and 2 and apply the following formula to calculate body weight:

Heart girth × heart girth × body length ÷ 300 = weight in pounds

Step Up a Ration

- As cattle grow, you will want to increase and possibly change their ration.
- **NEVER MAKE A RATION CHANGE ALL AT ONE TIME.** Step the ration up over a period of time. (Two to three weeks to step up a ration is a good rule of thumb.)
- Many producers will have at least four rations during the feeding period.

Cattle Mineral Issues

- Salt
  - Cattle usually have enough chlorine (Cl) but lack sodium (Na)
  - Little stored in body, need daily NaCl (salt)
  - 1 to 1.9 ounces per day (1,200 lb cow)
    - 0.005% to 0.010% of body weight daily
- Calcium:Phosphorus Ratio (Ca:P)
  - 2:1
  - Maintains bone strength
  - Blood clotting
  - Prevents urinary calculi

Calcium (Ca):Phosphorus (P)

- Calcium always needs to be higher in the diet than phosphorous.
- A reverse balance has serious health consequences.
  - Urinary calculi – water belly
  - Particularly for male animals
- Ratio:
  - Minimum 1.2 Ca : 1.0 P
  - Better 2.0 Ca : 1.0 P
  - Up to 3.0 Ca : 1.0 P

Cattle Mineral Issues

- Potassium (K)
  - Large amounts required daily
    - Often forage diets supply enough
    - High grain diets often deficient
      - 0.6% to 0.7% (DM basis) of the ration needed
  - Deficiency leads to
    - Loss of appetite
    - Poor gains
    - Stiffness
      - Often in front leg joints

Cattle Mineral Issues

- Iodine (I)
  - Rarely a cattle problem
  - Ethylenediamine dihydroidide (EDDI)
    - Legal max 50 mg/hd/day
      - » Foot rot Tx requires vet prescription
      - » Far exceeds legal mineral dose
- Fluoride (F-)
  - No known need by cattle
  - Found in rock phosphate used for phosphorus
    - Toxic to cattle but signs usually come too late
      - » Abnormal bone structure
      - » Softening of teeth

Cattle Mineral Issues

- Copper (Cu)
  - Deficiency is usually result of another mineral tying up its availability within the animal
    - Fertility problems
    - Depressed immunity
    - Loss of hair pigmentation (hair color fades)
- Iron (Fe)
  - Many mineral mixes contain Iron Oxide as a coloring agent – It is not bioavailable to the animal
    - Iron Sulfate is bioavailable to livestock
  - Deficiency leads to
    - Anemia
    - Lowered immunity
    - Lowered weight gains

Cattle Mineral Issues

- Cobalt (Co)
  - Deficiency in high grain diets
    - Loss of appetite & poor growth
  - Helps with quality hair growth, for livestock exhibitors
- Sulfur (S)
  - Common causes
    - High sulfur in water
    - Feeding corn by-products (distillers grain & corn gluten)
  - Toxic levels lead to
    - Copper deficiency
      - Binds with copper
    - Reduces feed intake
    - Poliencephalomalacia PEM
      - » Brain lesion

Cattle Mineral Issues

- Magnesium (Mg)
  - Deficiency leads to grass tetany
    - Occurs when grazing lush pasture or cereal grain forages
- Selenium (Se)
  - Dependent on local selenium levels in soil & forage
  - Deficiency
    - White Muscle Disease
    - Poor growth/low weaning weights
    - Retained placenta
    - Immune suppression
    - Cow infertility

Mineral	Lactating Cows	Pregnant Cows	Growing Cattle
Calcium (%)	0.45	0.30	0.45
Phosphorous (%)	0.20	0.20	0.30
Potassium (%)	0.70	0.60	0.60
Magnesium (%)	0.20	0.12	0.10
Sodium (%)	0.10	0.08	0.08
Copper (ppm)	10.0	10.0	10.0
Selenium (ppm)	0.20	0.20	0.20
Source: National Research Council, 1986			

Beef Cattle Mineral Requirements

Online Beef Cattle Mineral Tables

- University of Missouri
  - Mineral Supplements for Beef Cattle
  - http://extension.missouri.edu/p/G2081
    - Checked for availability February 16, 2020

Management Factors Influencing Growth

- Dry lot space requirements
  - Feedlot Space (per head)
    - Surfaced – 40 to 75 sq ft
    - Unsurfaced - 300 to 800 sq ft
    - Summer shade area – 25 to 35 sq ft
    - Mounds – 25 to 40 sq ft
  - Barn space (per head)
    - 20 to 30 sq. ft

Management Factors Influencing Growth

- Bunk space requirements
  - Linear (per head)
    - Calves – 18 to 22 inches
    - **Limited feeding - finishing cattle- 20 to 26 inches**
      - Free choice finishing ration – 3 to 4 inches
      - Free choice hay – 4 to 6 inches
    - **Limited feeding cows – 26 to 30 inches**
      - Free choice cows – 4 to 6 inches
  - Bunk depth – 18 to 20 inches
  - Bunk width: One side – 24 to 30 inches
    - Two side – 42 to 48 inches
  - Bunk height (throat level): Finishing 22 inches
    - Calves 12 to 18 inches

Management Factors Influencing Growth

- Altitude
  - Like people, some cattle can suffer from altitude issues
    - Altitude sickness
    - Adaptation problems
      - Bring these cattle to altitude gradually
    - Stressed breathing
    - Cardiac strain
    - Lowered appetite
    - Dehydration
    - Pulmonary edema (Brisket Disease)
      - Have cattle PAP tested above 6,000 ft
  - Altitude sickness susceptible cattle have more problems in the feedlot even at low altitudes

Management Factors Influencing Growth

- Water – 5 to 25 gallons per day
  - Weather dependent
- If they don’t drink, feed intake drops significantly
  - Needs to be clean
  - Needs to be fresh
  - Needs to be cool
    - Garden hoses in sun will heat up water & put calves off water
      - Shade or bury hoses used for water supply
  - Switching to chlorinated water may cause calves to quit drinking
  - Stray voltage

Daily High Temp (F*)	Cows Nursing Calves#	Dry & Bred Cows	Bulls	Growing & Finishing Cattle			
				400 lb	600 lb	800 lb	1,000 lb
	Gallons of Water per Day						
35*	11	6	7	4	5	6	8
50*	13	7	9	5	6	7	9
65*	16	8	11	6	7	9	11
80*	18	11	13	7	9	10	14
95*	20	15	20	11	15	17	19

#First four months of lactation.

Estimated Daily Water Intake of Cattle

(Adapted from a table by Paul Q. Guyer, University of Nebraska)

Management Factors Influencing Growth

- Cattle are gregarious animals
  - They don’t like to be penned by themselves
- Two or more calves together will gain weight much better than a lone calf

Basic Horse Nutrition

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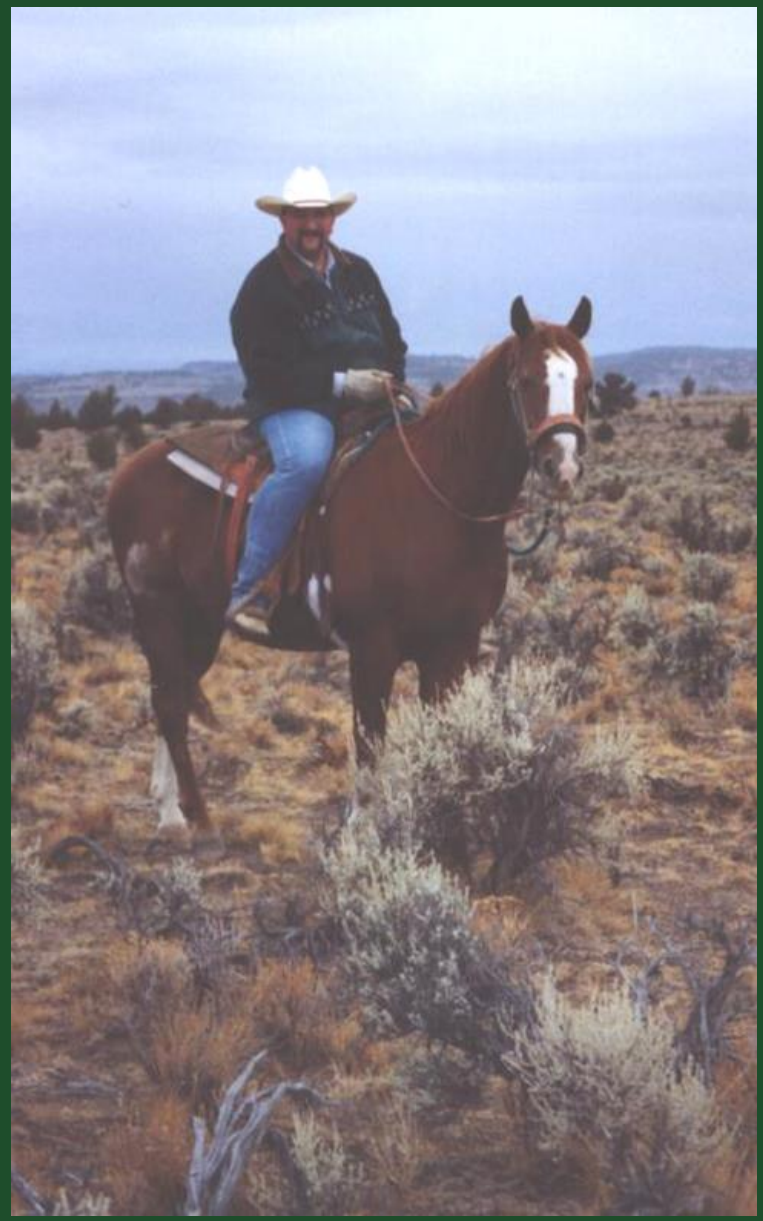

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Considerations in Feeding Horses

- Digestive system
- Feed available
- Nutrient requirements
- Feed management

Digestive System

- Non-ruminant herbivore
- Foregut
  - Enzymatic digestion
- Hindgut
  - Fermentative digestion

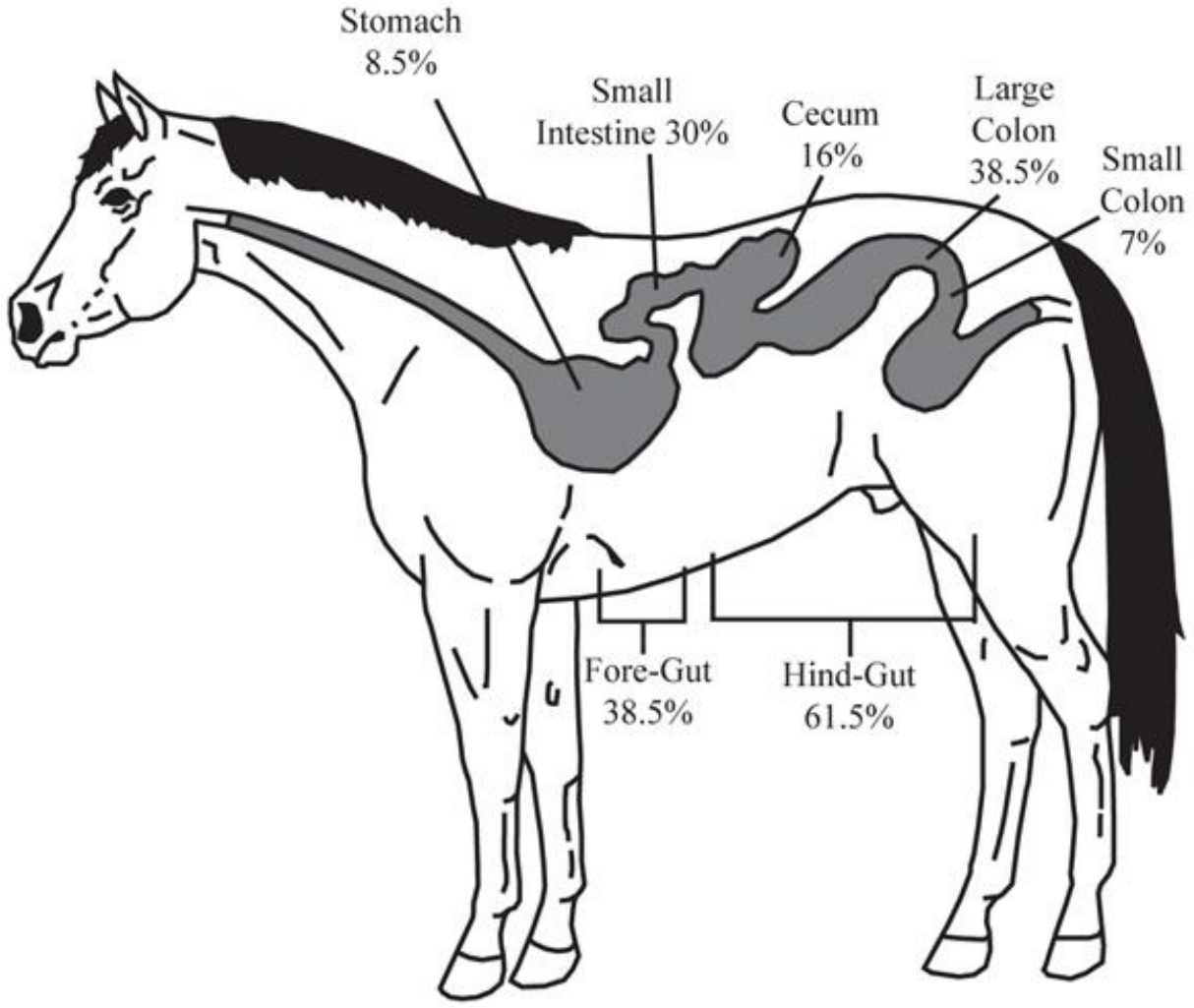

Diagram us from University of Nebraska NedGuide G1875 “Basics of Feeding Horses: What to Feed & Why” Written by Kathleen P. Anderson, Extension Horse Specialist

Foregut

- Stomach
  - Small
  - One-way passage
  - In many ways it acts like a humans stomach
- Small Intestine
  - Majority of nutrient digestion & absorption

Hindgut

- Large Intestine (cecum & colon)
  - Digest structural carbohydrates via microbial fermentation
    - Produces volatile fatty acids (VFA)
  - Synthesizes B vitamins and vitamin K
  - Majority of water absorption
  - Urea not useful as a protein supplement

Meeting Nutritional Needs of Horses

- Identify class of horse
- Determine nutrient requirements
- Select roughage source
- Determine portion of nutrient requirements met by roughage
- Select concentrate feed to meet remaining requirements (if any)

Nutrient Requirements

- Depends on class of horse:
  - Maintenance (Mature)
  - Growth
  - Reproduction
    - Gestation and lactation
  - Work

Nutrient Requirements

- Horses should be fed as individuals
  - Digestive and metabolic differences
    - “easy keeper”
  - Health status
  - Variations in nutrient content of feed
  - Previous nutritional status of horse
  - Climatic and environmental conditions

Components of a Horse Diet

- Roughages
  - pasture, hay, cubes

- Concentrates
  - Energy
    - oats, corn, barley, etc.
  - Protein
    - SBM, CSM, etc.
  - Additives
    - minerals, vitamins, etc.
  - Supplements

Hay Selection

A

B

C

D

Roughages

- Foundation of any feeding program
  - Provides daily nutrients
  - Maintains integrity of digestive tract
  - Minimizes vices

- Selection
  - Content & stage
    - High leaf: stem
    - Soft touch
  - Aroma, appearance, free of mold
  - Cleanliness
  - Green color

Provide a minimum of 1% of body weight daily

Horse Nutrition Resources

- Horse Nutrition & Hay Selection Articles
  - University of Nebraska Extension
    - Animal Agriculture Section has numerous articles on horse nutrition.
      - http://extensionpubs.unl.edu/search/?category=AAG&amount=100
        - » Accessed February 16, 2020
  - Michigan State University Extension
    - Articles Section of My Horse University
      - https://www.myhorseuniversity.com/articles
        - » Accessed February 16, 2020
  - University of Minnesota Extension
    - https://extension.umn.edu/horse/horse-nutrition
      - Accessed February 16, 2020 Numerous articles to choose from.

Energy Feeds

- Oats
  - Popular and safe
  - Expensive
- Corn
  - Highest energy
  - Usually processed
- Barley
  - High energy
  - Usually processed
- Sorghum
  - High energy
  - Must be processed

Very Basic Swine Feeding

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Expected Pig Gain

Average Daily Gain

50-110 lbs……..1.5 lbs/day
110-230 lbs…….1.8 lbs/day

Expected Weights

Age	Weight
3 wks	14 lbs
5 wks	23 lbs
8 wks	40-50 lbs*
11 wks	70-85 lbs
15 wks	110-130 lbs
20 wks	170-195 lbs
24 wks	220-260 lbs*

***3.7 months from 40 to 220 lbs**

Washington State University Swine Manual.

Weigh Your Pig Often

- Monitor what your pigs are eating.
- Expect variations between pigs.
- Expect variations between recommendations.

Pig Weight	40 LBS	100 LBS	150 LBS	200 LBS
LBS Feed/Day	3 LBS	4.5 LBS	5.6 LBS	6.5 LBS
~ADG	1 LB	1.75 LBS	1.75 LBS	2.25 LBS
Protein Level	18%	16%	16%	14%

Selecting & Feeding Market Swine (M. Livingston, 2012).

Calcium (Ca):Phosphorus (P)

- Calcium always needs to be higher in the diet than phosphorous.
- A reverse balance has serious health consequences.
  - Urinary calculi – water belly
  - Particularly for male animals
  - Blood clotting problems
  - Weakened bone health
- Ratio:
  - Minimum 1.3 CA : 1.0 P
  - Better 2.0 Ca : 1.0 P
  - Up to 3.0 Ca : 1.0 P

Amino Acids

- The pig doesn’t have a true crude protein (CP) requirement
- Rather, the pig requires specific amounts of 10 essential amino acids, which equate to the pig’s protein need
- Of the 10 essential amino acids, three tend to be the most limiting factors in grain based swine diets
  - Lysine
  - Tryptophan
  - Threonine

Amino Acids

- 10 essential amino acids for swine diets
  - Lysine
  - Tryptophan
  - Threonine
  - Methionine
  - Isoleucine
  - Histidine
  - Valine
  - Arginine
  - Phenylalanine
  - Tyrosine
- Be sure these are in the pig's diet

What To Feed

- That depends……
  - What is available?
  - What can you get a hold of?
  - Are you going to buy a feed ration?
  - Are you going to make a feed ration?
- I'm pro home rations for ruminants but not for pigs or chickens
  - Complex rations with many amino acid & mineral issues
  - If you are not really experienced with ration making, purchasing a TMR may be your best choice

Percentages & Amounts

- Vary with growth stage
- Consult your feed dealer
- See table on page 8-11 of Swine Resource Handbook
  - This is a 4-H Manual published at The Ohio State University but it has a lot of good information in it that a small swine operation can put to good use.
  - Check with your local Extension office to see if they have a copy. (In Colorado our offices have access to it but I don't know about in Alaska.)
  - I'm not endorsing purchase of it but it is sold online.

Energy Swine Feeds

- Corn
- Milo
- Whole grain barley
- Whole grain oats
- Wheat
- Wheat middlings
- Soybean Hulls
- Dried Whey

Common Protein Swine Feeds

- Cottonseed Meal
  - CSM
- Soybean Meal
  - SBM
- Linseed Meal
- Corn Gluten Meal
- Corn gluten feed
- Distillers grain
- Brewers grain
- Fish meal
- Dehydrated alfalfa meal pellets
  - Dehy

Nutrient Tables

- **DMI** stand for Dry Matter Intake. It is how much feed an animal eats if there was no moisture in the feed. Allows you to compare the nutrient level of two feeds.
- **TDN** stands for Total Digestible Nutrients and is a measurement for how much energy a feed provides.
- **CP** stands for Crude Protein and is the measurement of how much protein a feed provides.

Management Factors Influencing Growth

- Bunk space
  - Minimum of 1 space per 4 pigs
  - More space per pig allows for less bunk competition
- Waterers
  - Minimum 1 space per 15 pigs
- Confined floor space
  - Minimum of 4 sq. ft per pig (40 to 100 lbs)
  - Minimum of 6 sq. ft per pig (100 to 150 lbs)
  - Minimum of 8 sq. ft per pig (150 lbs to market)
- Outside lot space
  - Minimum of 5 sq. ft per pig under shade/roof
  - Minimum of 15 sq. ft per pig outside

Management Factors Influencing Growth

- Sunburn
  - Pigs are susceptible to sunburn
  - Causes skin pain when they walk
    - Prevents them from going to feed
  - Sunburn is worse at altitude
    - Thinner oxygen level
    - Less pollution
  - Reflection from snow increases sunburn potential/severity
  - Confined hogs suffer sunburn when taken outside
  - Freshly clipped pigs are more susceptible

Management Factors Influencing Growth

- Altitude
  - Like people, some swine can suffer from altitude issues
    - Altitude sickness
    - Adaptation problems
      - Bring these pigs to altitude gradually
    - Stressed breathing
    - Cardiac strain
    - Lowered appetite
    - Dehydration

Management Factors Influencing Growth

- Water – If they don’t drink, feed intake drops significantly
  - Needs to be clean
  - Needs to be fresh
  - Needs to be cool
    - Garden hoses in sun will heat up water & put pigs off water
      - Shade or bury hoses used for water supply
  - Switching to chlorinated water may cause pigs to quit drinking
  - Stray voltage
    - Pigs are one of the most electrical sensitive animals
    - They can feel voltage that we don’t

Management Factors Influencing Growth

- Feeding ractopamine HCL
  - Brand name Paylean®
  - Always follow label directions
  - Check show rules before feeding this product
  - I absolutely am not endorsing this product but I find if I don't mention it someone will ask about it
  - Beta agonist
  - Converts nutrients into lean development instead of fat
  - FDA approved in swine during last 45 to 90 days before harvest
  - Positive carcass growth characteristics
  - Negative carcass consumer characteristics

Questions?