INTRODUCTION

This manual has been developed as a study guide for the Florida State Fair Skillathon which is part of the Champion Youth Program. The topic for this year's Skillathon is **nutrition and feeding management**.

The Florida State Fair recognizes that agricultural education instructors, 4-H agents, YLPA representatives, parents, and leaders provide the traditional and logical instructional link between youth, their livestock projects and current trends in the animal agriculture industry. **PLEASE NOTE:** This manual is provided as a ***study guide*** for the skillathon competition and should be used as an additional aid to ongoing educational programs.

Sections are labeled **Junior, Intermediate & Senior, Intermediate & Senior, or Senior** to help exhibitors and educators identify which materials are required for each age level.

****** Additional information is noted in the study manual for preparing for the Champion of Champions competition.

Juniors (age 8-10 as of September 1, 2022)
Digestive tract parts identification
Feed classification & identification

Intermediates (age 11-13 as of September 1, 2022)
Digestive tract functions
Feed tag analysis
Aging by teeth

Seniors (age 14 and over as of September 1, 2022)
all of the above plus....
Evaluating Feed Efficiency
Evaluating and selecting feedstuffs
Body Condition Scoring
Poisonous plants

GOOD LUCK

Dairy Nutrition

What an animal eats, how it is digested, absorbed, utilized and what is excreted is the essence of *nutrition*. Good nutrition is basic to good health and production. Proper feeding management requires knowledge of the nutrients in the feedstuffs available to the producer and the nutrient needs of their animals. It also includes an understanding of animal behavior and a management strategy that allows the animals to consume all that is required without causing digestive upset. Though general rules of thumb are helpful, each situation may require adjustments in order to optimize growth and production. Specific nutritional requirements by age, size, and production are provided by the National Research Council in *Nutrient Requirements of Dairy Cattle*, 8th Edition, which was revised in 2021.

Nutrients are substances in the diet that support normal body functions. Some nutrients can be manufactured in the animal's body and are classified as *dietary non-essential*. *Dietary essential* nutrients must be provided in the ration. Nutrients can be classified into six groups: *water, carbohydrates, fats (lipids), proteins, vitamins, and minerals.*

Water is the most essential nutrient and is involved in all body functions. It is the most abundant and therefore the cheapest nutrient. Animals receive water from drinking, as well as from feeds that contain water. An animal that is not receiving enough water will not eat well. Factors which affect an animal's water consumption are the animal's size, milk production, feed intake, environmental temperature, humidity, and water quality.

Proteins function as the basic structural unit of the animal body and in metabolism. Protein is the main component of the organs and soft structures of the animal body with the exception of water. The dietary requirement for protein is highest in young, growing animals. All proteins are composed of simple units called amino acids. The amino acids in a protein determine the quality of that protein. Protein is one of the most expensive portions of the diet. Specific amino acids are usually the limiting factor in the amount of growth or production an animal is capable of reaching. To determine the amount of protein in the diet, the amount of Nitrogen (N) is determined in a laboratory and multiplied by 6.25.

Carbohydrates are organic compounds containing Carbon, formed in plants by the process of photosynthesis. Carbohydrates serve as a source of energy in the body. Starch and sugar are carbohydrates that are rapidly digested, while the complex carbohydrates in forages require fermentation in the rumen by microbes to produce volatile fatty acids (VFAs). A surplus of carbohydrates can be transformed into fat and stored.

Fats function much like carbohydrates in that they serve as a source of energy. Fats produce 2.25 more energy than carbohydrates when digested; therefore a smaller amount is required to serve the same function. Fats are essential for proper metabolism in the animal and can be fed to increase energy, but should be done carefully. Feeding too much fat or unsaturated fat can negatively affect rumen microbes and depress milkfat.

Vitamins are essential for the development of normal tissue and necessary for metabolic activity. They are effective in the animal body in small amounts. When not consumed in an adequate amount a specific deficiency disease can result, or toxicity may result if eaten in extremely high amounts. Vitamins are classified as being either fat soluble (A, D, E, K) or water soluble (B complex & C). Fat soluble vitamins must be consumed in the diet.

Minerals are inorganic, solid, crystalline chemical elements. They are classified as being either macro (Ca, P, Na, Cl, K, Mg & S) meaning required in high concentrations or micro (Cr, Co, Cu, F, Fe, I, Mn, Mo, Ni, Se, Si, & Zn) meaning required in trace amounts. Calcium makes up nearly 50% of the total body mineral, phosphorus composes 25%, and other minerals make up the remaining 25%. Minerals function in immune response, protein synthesis, oxygen transport, and in skeletal formation and maintenance.

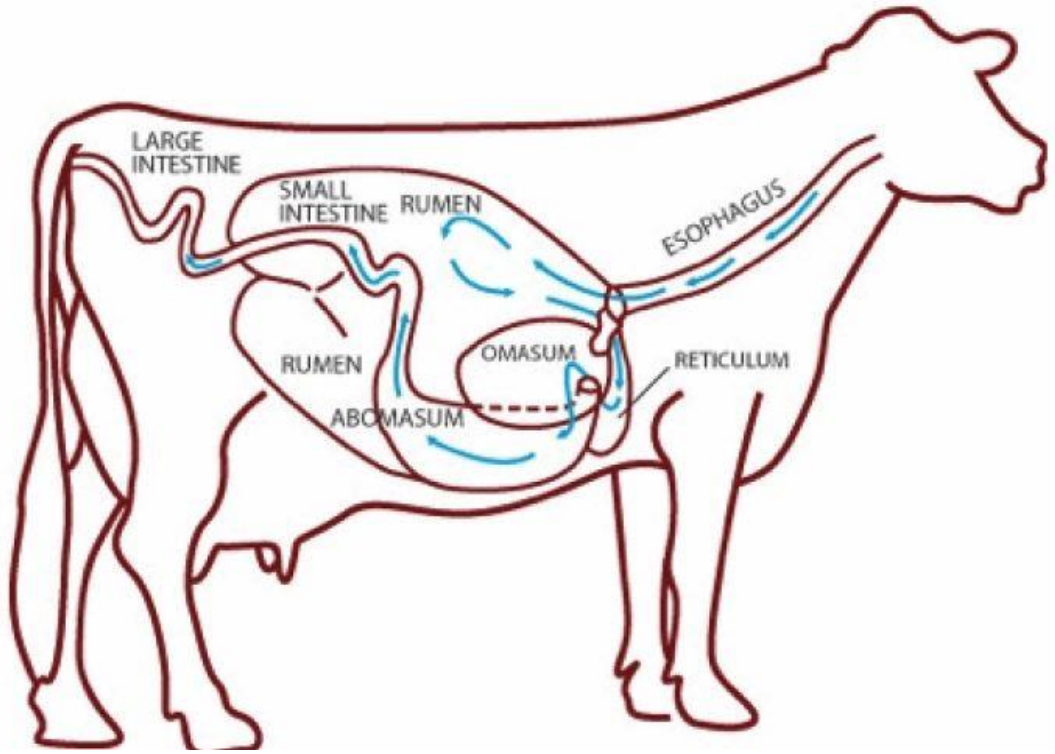
Specific nutrient requirements vary between species but also between individuals. Factors such as weight, environmental temperature, and level of production must be considered when determining optimum nutrient levels in a ration. Though it is tempting to provide more than enough as insurance, some nutrients cause problems (toxicity) if fed in excess. Also, the feeding of livestock accounts for 55-65% of production costs so overfeeding shrinks profits. Most dairy rations are formulated to feed the animal at 101-105% of their requirements, depending on their stage of lactation.

Digestive Anatomy

Juniors, Intermediates and Seniors

Farm animals are grouped by what they eat, which is based on the type of digestive system they possess. *Herbivores* are vegetarians (cattle, sheep, goats, rabbits). *Carnivores* are flesh eaters (dogs). *Omnivores* eat both flesh and plants (pigs, chickens, humans). Based on the digestive system, animals are grouped as *monogastric* or *simple stomach* (pig), *polygastric* or *ruminant* (cattle, sheep, goats), *avian* (chickens), or *pseudo-ruminants* with a functional cecum (rabbits, horses,). Understanding the digestive system is fundamental to selecting the proper feeds and feeding system for your animal.

After studying this manual, you should be able to identify the parts of the digestive tract of a dairy cow and tell the function of each part.



Juniors, Intermediates and Seniors

Feed Classification and Identification

Rations are formulated to meet the specific needs using minimums, maximums, and guaranteed analysis or potency. Many animals receive a complete feed (mixed or pelleted) but it is useful to understand the specific ingredients that make up the ration or diet. Go to the web site: https://quizlet.com/subject/Feed-ID/ and study feed ingredients so that you can visually identify those typically used in livestock feeds.

Though we generally group feeds into roughages (high fiber, >18% crude fiber less digestible) and concentrates (low fiber, <18% crude fiber, more readily digestible). There are 8 international feed classes that are based on content and use.

1. Dry forages and roughages – cut and cured products with >18% fiber; hay, straw, seed hulls, fodder, and stover.

2. Pasture, range plants and forages fed fresh – pasture and green chop.

3. Silages and haylages – plant material preserved through the ensiling process, forages like corn, alfalfa, sorghum, and grasses.

4. Energy feeds – products with <20% CP, <18% CF and > 70% TDN, like cereal grains (corn, oats, wheat), mill byproducts, beet and citrus pulp, molasses, animal, marine and vegetable fats, nuts, roots and tubers.

5. Protein supplements – products with >20% CP or more; protein from non-ruminant animal origin, oilseed meals like soybean or cotton, legume seeds, milling by-products of grains, brewery and distillery by-products, corn gluten meal, yeast, non-protein nitrogen often in the form of Urea.

6. Mineral supplements; guaranteed analysis

7. Vitamin supplements; guaranteed potency

8. Non-nutritive additives – supplements such as antibiotics, antioxidants, probiotics, buffers, coloring material, binders, flavors, hormones and medicines.

Calf Nutrition

Juniors, Intermediates and Seniors

Feeding a dairy calf is fundamentally different than feeding a dairy cow. The first milk a calf receives is called colostrum. It is high in protein and fat and provides vital antibodies that serve as the basis of the calf's immune system. Calves that receive quality colostrum (>50 mg/mL with a colostrometer or 22% with a Brix refractrometer) have a significantly higher rate of survival and less cases of illness. Calves should be fed 10-17% of their body weight in whole milk or milk replacer. Milk replacer should be evaluated to determine the source of nutrients. Generally, sources of fat and protein from animal sources are more digestible than sources of fat from plant sources. Calves should be offered clean, fresh water and a palatable starter from

their 1st day of life (even though they will get most of their required nutrients from their liquid diet. The starter diet is effective to begin the development of the papillae in the rumen lining. Healthy papillae are necessary for digestion of all nutrients, especially the forage portion that will make up a large portion of the nutrients when the calf develops a functioning rumen. While calves will start chewing their cud around 2-3 weeks of age, they do not have a functioning rumen until about 3 months old. Calves can be weaned, or taken off milk, when they are consuming 2-3 lbs of calf starter for 3 days in a row. Calf starter should contain 18-22% protein and calves should be given access to grass for grazing or fed high quality dry hay.

Replacement heifers are expected to reach puberty and enter the breeding herd at 12 - 15 months of age. Heifers should not be bred until they reach 55% of their expected mature body weight. Ionophores (lasalocid and monensin) are often fed to heifers to improve rate of gain, increase feed efficiency and to help fight coccidiosis. It is important to balance protein and energy to encourage growth and discourage excess fat in heifers.

Digestive Function

Intermediates and Seniors

The physical and chemical changes of feed within the gastrointestinal tract that allow nutrients to be released and absorbed into the body are called digestion. There are significant differences in the digestive processes between species. The type of digestive system an animal has determines what the animal can successfully use as feed. Complicated feed (forage) requires a complicated digestive tract (ruminant). The steps in digestion include: prehension (gathering), mastication (chewing), salivation, deglutition (swallowing), microbial, enzymatic and chemical breakdown, absorption of nutrients, defecation, and micturition (urination). For a review of rumen anatomy visit: http://mc050.k12.sd.us/Ruminant%20Digestive%20System.ppt.

Mouth- Upper dental pad, lower incisors and both upper and lower molar teeth, and tongue are used in prehension, mastication, and salivation.

Esophagus- Hollow muscular tube that transports food from the mouth to the stomach

Stomach- four compartments: Rumen, Reticulum, Omasum and Abomasum (50 gallons)

Rumen- Large, hollow, muscular compartment that almost entirely fills the left side of the abdomen, functions in storage, soaking, mixing and microbial fermentation, and acts to absorb nutrients produced by the rumen microbes, i.e. volatile fatty acids, ammonia).(40 gallons) 80%

Reticulum- Nicknamed honeycomb, functions in moving ingested feed into the rumen or into the omasum and regurgitation of partially chewed food during rumination. Has very thick walls, traps foreign objects. (2 gallons) 4%

Omasum- Nicknamed “many plies” or butcher’s Bible, reduces particle size and removes water. It is located on the right side. (4 gallons) 8%

Abomasum- This is the glandular portion of the stomach which produces acid and pepsin. It is located on the right, is called the true stomach and is where enzymatic digestion begins. (4 Gallons) 8%

Sm. Intestine- Pancreatic and intestinal juices break down proteins and carbohydrates while bile from the liver breaks down fats. The first section (duodenum) is involved in digestion, and the next two sections (jejunum & ileum) are actively involved in nutrient absorption. (17 gallons and 150 feet)

Lg. Intestine- Mainly absorbs water and end products of microbial digestion. The cecum has little function in ruminants. The colon is the site for water resorption and storage reservoir of undigested material which passes out of the rectum as feces. (8 gal.)

Feed Tag Analysis

Intermediates and Seniors

It is required by law that all commercial feed products carry a proper label. You should be able to read and understand the information on a feed tag. Some of the information included will be: net weight in pounds, company brand name (trade name), product name (class or use), product type (textured, pelleted, extruded, etc.) purpose statement, warning or cautions, active drug ingredient (when applicable), guaranteed analysis (protein, fat, fiber, etc.), feed ingredients in order of content, company name and address, detailed use directions, other feeds (suggestions for other feeds in the total program). Go to a feed store and look at the tags on several types of feeds and determine which feeds are best suited to your program and which are the best value in terms of nutrients per dollar. Be prepared to interpret the information on a feed tag. http://www2.ca.uky.edu/agcomm/pubs/ASC/ASC216/ASC216.pdf

Guaranteed Analysis:

Crude Protein: not less than __%
This number represents nitrogen content of feed and does not give a clear picture of protein quality, (e.g. amino acid profile). If all of the protein is not from "natural" ingredients (e.g. contains urea or a similar product) the following statement must be added, "this includes not more than __% equivalent protein from non-protein nitrogen"

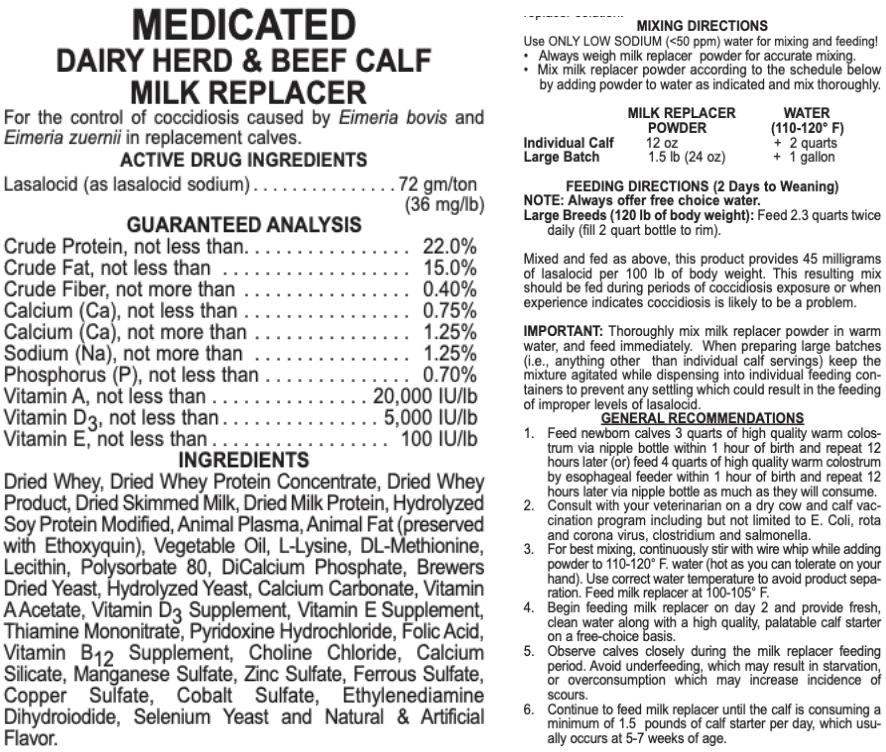
Crude Fat: not less than __%
At equal volumes fat contributes 2.25 times the amount of energy compared to carbohydrates. Increased crude fat levels can decrease digestion of forages (e.g., hays and grasses). Fat can be added to the diet in hot weather to maintain energy level when intake decreases. Fat can also decrease palatability.

Crude Fiber: not more than __%
The higher the crude fiber, generally, the lower the digestible energy of the feed. Some feed labels separate the fiber portion into another measurement, i.e. Max ADF % to guarantee a level of digestibility

Macro minerals are often listed in minimum/maximum. Micro minerals can be listed in minimum/maximum or parts per million (PPM). Vitamins are listed in International Units per pound (IU/lb).

Ingredients: listing on the tag does not necessarily identify individual feedstuffs. Instead, it can list *categories* of feedstuffs, e.g., *grains products* (such as corn, oats, barley, wheat), *processed grain by-products* (bran, brewers' grain, hominy), *plant protein products* (soybean meal, cottonseed meal, etc.), *molasses products* (cane or beet molasses, dehydrated molasses, wood molasses), and *forage products* (alfalfa meal or leaf meal). The phrase, *roughage products*, identifies the presence of hulls or ground hays or fodder. This total must be shown as a percentage of the feed. Their presence will cause the crude fiber guarantee to be high (16-26% or more) and, as indicated above, lowers the digestible energy content.

The feed tag will also list active ingredients for medicated feed, sources of minerals, any preservatives used, and any vitamin supplements present or used. Evaluating the sources of protein and fat is especially important in nutrition of calves. Many feed tags will provide recommendations for feeding. The nutrients provided to calves in the form of milk replacer are important to evaluate. Milk replacer should contain animal fats and proteins. While some plant fats and proteins can be safely used, young calves may not be able to fully digest them. Look at the example of milk replacer and it's nutrients. Then evaluate the ingredients to determine the source of the nutrients. Can you identify an animal fat and protein / a vegetable fat and protein?



MEDICATED
DAIRY HERD & BEEF CALF MILK REPLACER

For the control of coccidiosis caused by *Eimeria bovis* and *Eimeria zuernii* in replacement calves.

ACTIVE DRUG INGREDIENTS

Lasalocid (as lasalocid sodium) . . . . . 72 gm/ton (36 mg/lb)

GUARANTEED ANALYSIS

Crude Protein, not less than	22.0%
Crude Fat, not less than	15.0%
Crude Fiber, not more than	0.40%
Calcium (Ca), not less than	0.75%
Calcium (Ca), not more than	1.25%
Sodium (Na), not more than	1.25%
Phosphorus (P), not less than	0.70%
Vitamin A, not less than	20,000 IU/lb
Vitamin D_3, not less than	5,000 IU/lb
Vitamin E, not less than	100 IU/lb

INGREDIENTS

Dried Whey, Dried Whey Protein Concentrate, Dried Whey Product, Dried Skimmed Milk, Dried Milk Protein, Hydrolyzed Soy Protein Modified, Animal Plasma, Animal Fat (preserved with Ethoxyquin), Vegetable Oil, L-Lysine, DL-Methionine, Lecithin, Polysorbate 80, DiCalcium Phosphate, Brewers Dried Yeast, Hydrolyzed Yeast, Calcium Carbonate, Vitamin A Acetate, Vitamin D_3 Supplement, Vitamin E Supplement, Thiamine Mononitrate, Pyridoxine Hydrochloride, Folic Acid, Vitamin B_{12} Supplement, Choline Chloride, Calcium Silicate, Manganese Sulfate, Zinc Sulfate, Ferrous Sulfate, Copper Sulfate, Cobalt Sulfate, Ethylenediamine Dihydroiodide, Selenium Yeast and Natural & Artificial Flavor.

MIXING DIRECTIONS

Use ONLY LOW SODIUM (<50 ppm) water for mixing and feeding!

- Always weigh milk replacer powder for accurate mixing.
- Mix milk replacer powder according to the schedule below by adding powder to water as indicated and mix thoroughly.

	MILK REPLACER POWDER	WATER (110-120° F)
Individual Calf	12 oz	+ 2 quarts
Large Batch	1.5 lb (24 oz)	+ 1 gallon

FEEDING DIRECTIONS (2 Days to Weaning)

NOTE: Always offer free choice water.

Large Breeds (120 lb of body weight): Feed 2.3 quarts twice daily (fill 2 quart bottle to rim).

Mixed and fed as above, this product provides 45 milligrams of lasalocid per 100 lb of body weight. This resulting mix should be fed during periods of coccidiosis exposure or when experience indicates coccidiosis is likely to be a problem.

IMPORTANT: Thoroughly mix milk replacer powder in warm water, and feed immediately. When preparing large batches (i.e., anything other than individual calf servings) keep the mixture agitated while dispensing into individual feeding containers to prevent any settling which could result in the feeding of improper levels of lasalocid.

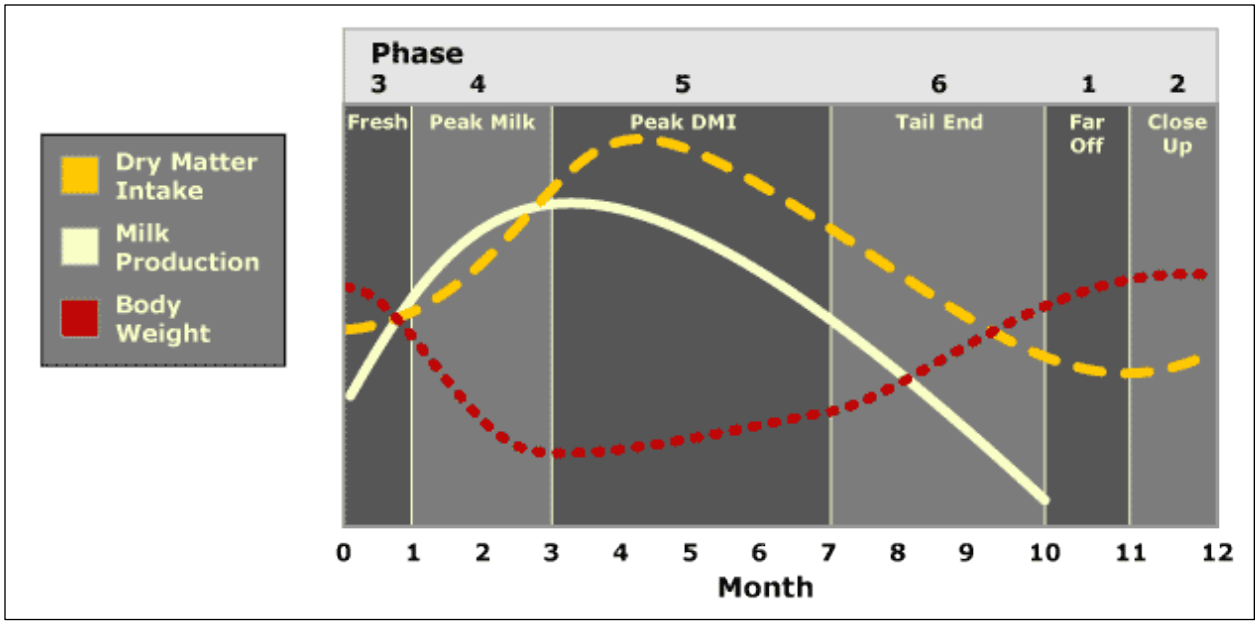
GENERAL RECOMMENDATIONS

1. Feed newborn calves 3 quarts of high quality warm colostrum via nipple bottle within 1 hour of birth and repeat 12 hours later (or) feed 4 quarts of high quality warm colostrum by esophageal feeder within 1 hour of birth and repeat 12 hours later via nipple bottle as much as they will consume.
2. Consult with your veterinarian on a dry cow and calf vaccination program including but not limited to E. Coli, rota and corona virus, clostridium and salmonella.
3. For best mixing, continuously stir with wire whip while adding powder to 110-120° F. water (hot as you can tolerate on your hand). Use correct water temperature to avoid product separation. Feed milk replacer at 100-105° F.
4. Begin feeding milk replacer on day 2 and provide fresh, clean water along with a high quality, palatable calf starter on a free-choice basis.
5. Observe calves closely during the milk replacer feeding period. Avoid underfeeding, which may result in starvation, or overconsumption which may increase incidence of scours.
6. Continue to feed milk replacer until the calf is consuming a minimum of 1.5 pounds of calf starter per day, which usually occurs at 5-7 weeks of age.

Evaluating and Selecting Feeds

Seniors

Dairy cows can consume over 100 lbs of feed every day to achieve high levels of production. A challenge for dairy producers and nutritionist when evaluating and selecting feeds is the changing nutrient requirements in the dairy cow's production cycle. Changing the ration to match the requirements at different stages of lactation will optimize production and the health of the cow.



_ _ _ _ _ Dry matter intake _____ Milk production --------- Body weight

Phase 1 – Provide a balanced ration, but do not over feed energy. Cows should be prevented from gaining body condition during this phase.
Phase 2 – Close up diets can prevent problems at calving and lead to an easier transition. Feeding a DCAD (dietary cation anion difference) allows cows to metabolize minerals (especially calcium) from their body, effectively preventing milk fever from occurring following calving.
Phase 3-4 – Cows experience negative energy balance during this phase. They are unable to consume enough feed to meet the demands of production. Feeding fat during this time can help cows take in more energy in smaller amounts.
Phase 5 – Cows peak in dry matter intake during this phase. During phase 5 the cows should be pregnant, but the fetus is small and does not take up enough room to interfere with intake.
Phase 6 – During this phase milk production and feed intake decrease. This is the phase when the cow can regain body condition. The cow is also entering her highest nutritional demand for the fetus during this phase.

The type of animal being fed is a critical consideration in selecting a feed. Spend time thinking about your feeding management situation and the types of feeds you have available. Be prepared to judge the relative value of feeds for various scenarios. There are several methods to assess the value of a feed.

1. Physical evaluation of feedstuff: Does it look good and smell good? Is it free of dust and mold? Is it fresh? Can you see indicators of quality such as high leaf to stem ratio in hays or a high percentage of corn in a finishing ration?

2. Cost per unit of nutrients: This requires some analysis and calculations but it is not difficult.

Example:

Product	**Soybean Meal**	**Linseed Meal**
Crude Protein	44%	35%
Cost	$9.40 per 100 Pounds	$5.50 per 100 pounds

To solve this problem you must determine the value of each feedstuff for protein:
- Do this by dividing the cost by the percentage of protein

Soybean Meal: $9.40⁄44 = 21 cents per pound of Crude Protein
Linseed Meal: $5.50/35 = 15 cents per pound of Crude Protein
Therefore linseed meal is cheaper.

Another way is to look at productivity. If you must feed your animal twice as many pounds of a low cost, but low protein feed to achieve 100 pounds of gain, it may be more cost effective to pay a higher price and feed less total pounds of feed.

Example:
Let's look at the feed stuffs from above but add in rate of gain expected for each feed.

Product	**Soybean Meal**	**Linseed Meal**
Crude Protein	44%	35%
Cost	$9.40 per 100 Pounds	$5.50 per 100 pounds
Rate of Gain	1 pound of gain per 4 pounds of feed	1 pound of gain per 7 pounds of feed

Solve for cost per pound of gain.
- First, determine cost per pound of feed
  Soybean Meal $9.40/100 pounds = $0.094/pound
  Linseed Meal $5.50/100pounds = $0.055/pound
- Next, determine cost per pound of gain
  Soybean Meal: $0.094 /pound X 4 pounds feed/pound gain = $0.376/pound of gain
  Linseed Meal: $0.055 /pound X 7 pounds feed/pound gain = $0.385/pound of gain
- On a cost of gain basis, Soybean Meal is slightly cheaper

3. There are several chemical analyses that are performed on feeds by the companies that produce them. This information is useful in evaluating quality.

4. An often-used method of determining quality is to do a home feeding trial. You may do this already without thinking about it. If you run into problems one year, you adjust the next year. With limited numbers of animals, this is a slow, often costly process.

Evaluating Feed Efficiency

Seniors

Performance in growing heifers can be evaluated by calculating average daily gain as well as feed efficiency. Feeding management strategies should strive to optimize growth to reach the desired end point in an appropriate time frame. For example; if the beginning of the breeding season is 175 days away and your heifer must gain 300 pounds in order to reach puberty or a desirable body condition, the heifer must gain an average of 1.71 pounds per day. If the heifer eats 11 pounds of feed per day for 175 days at that rate of gain, feed efficiency for that period of time is 6.4 pounds of feed per pound of gain. The cost of gain is determined by multiplying the cost per pound of feed by the pounds of feed per pound of gain. Therefore, in this scenario, $8.00 per 100 pounds of feed with 6.4:1 feed efficiency comes out to $0.51 per pound of gain.

Evaluating Body Condition

Seniors

Adjustments in feeding management require knowledge of the individual or herd nutritional status. Changes in body condition or fat deposition provide valuable insight. The degree of fatness is evaluated visually from the rear and side view of the cow. Below are the descriptions of the 5 body condition scores used in dairy production. You should be familiar with this system of evaluation and its applications.

BCS 1 From the side the bones of the tailhead are easy to see and the backbone has a “saw-tooth" appearance. Individual short ribs are clearly visible, and the hooks, thurl, and pins protrude sharply, with deep depressions between bones. From the rear all boney prominences are easily visible and protrude sharply. Deep cavities have formed around the tailhead and between the pin bones. The cow's ligaments and vulva are prominent, and her legs are thin with poor muscle condition.

BCS 2 The tailhead and backbone are prominent, with limited skin cover. Limited skin cover is seen on the short ribs, and from their tip to the spine, the short ribs are clearly visible for three-fourths of the distance. The hooks and pins are angular, with a prominent thurl joint. From the rear view, the hooks, pins, and thurl are prominent. The tailhead area is somewhat hollow, but has a modest covering of flesh.

BCS 3 At a score of 3, more flesh covers the backbone, and its appearance is more of a rounded ridge. The tips of the short ribs are smooth. The hooks and pins are also rounded and smooth, but the angle between the hooks, thurl, and pins forms a V. From the rear, the hooks and pins are rounded and smooth. No deep depressions are found around the tailhead; it appears smooth, without signs of fat deposits.

BCS 4 From the side, this cow's backbone and the tips of her short ribs are barely visible. The hooks and pins are very smooth, but the bones are still visible. However, the area between the hooks and pins is fat-filled and flat. Viewing the cow from behind, her hooks and pins are rounded, but visible. As from the side, the area above the thurl is flat and the span between the hooks is flat as well. Neither the sacral nor the tailhead ligament is visible.

BCS 5 At the highest score, the backbone, hooks, and pins are no longer visible. The bones of the short ribs also disappear, and the entire area over the ribs and rump is flat. The tailhead area appears rounded and fat deposits are very evident. From the rear, all boney prominences are rounded and covered in fat and the tailhead appears to be buried in fat. In addition, fat deposits are readily seen on the rump and legs.

Review examples of body condition scores here https://extension.psu.edu/examples-of-cows-at-various-body-condition-scores#section-0

Feed Safety & Veterinary Feed Directive

Seniors

For decades, antimicrobials and antibiotics have been used in animal feeds at “sub therapeutic” levels to improve growth and feed efficiency. To fight diseases in humans and livestock, antimicrobials are used at therapeutic levels to fight a variety of microorganisms (bacteria, viruses, fungi, parasites) while antibiotics specifically fight bacteria. Microbial resistance is a phenomenon that can develop in humans and animals. The Food and Drug Administration is working with the livestock and feed manufacturing industries to develop strategies to limit the potential for development of resistant microbes. Drugs that are important for treating human disease cannot be used for production purposes. Drugs use to fight animal disease require veterinary supervision and a veterinary feed directive. More information about using products that require a VFD can be found here.
https://bqa.unl.edu/documents/Nebraska%20Youth%20VFD%20Flyer%20Edit%201-4-17.pdf
Please read about Antibiotics in Livestock & Poultry Production so that you can sort fact from fiction.
https://www.meatinstitute.org/index.php?ht=d/sp/i/102248/pid/102248

Poisonous Plants

Seniors

There are many plants which are harmful to cattle. Most of the time cattle will not eat them but in drought situations, they may. Some examples are: Bracken fern, Cocklebur, Elderberry, Low Larkspur, Oak, Tall Larkspur, Timber milk vetch, Pigweed, Water hemlock, Broom weed, Choke cherry, Copper weed, Desert parsley, Halogeton, Locoweed, Leupine, Milk weed, Lambs quarters, Crotolaria, Lantana, Oleander, Rhododendron, Perillamint, Poinsettia, and Nightshade. With regards to poisonous plants, there are a couple of things to keep in mind:

1. The plant species determines the poisonous substance that causes the problem. A number of things affect the severity of poisoning which include the specific part of the plant, environmental conditions, plant age, and the form the plant is consumed.

2. Some of the common symptoms of poisonous plant consumption include: diarrhea, vomiting, dilated pupils, altered pulse rate (slow or fast), labored breathing, dark urine, uncoordinated, bleeding, skin ulcers, muscle spasms, paralysis, and death.

Visit the following web sites to learn about the poisonous plants in the southeast.

https://www.youtube.com/watch?v=7c2diignyQk

http://www.ansci.cornell.edu/plants/anispecies.html

Processing Feeds

Seniors

Because feed cost is 55 - 65% of expenses in animal production, it is vital that a diet contain the correct nutrient content and be in a form that will encourage consumption, while minimizing waste. Feeds are often processed by mechanical, chemical or thermal methods in order to alter the physical form, particle size, prevent spoilage, isolate certain parts of the seed or plant, to improve palatability and digestibility, or sometimes to inactivate toxins. Occasionally feed is processed to improve handling, like chopped hay. Some methods include: roller mill cracking, hammer mill grinding, steam-rolled and steam-flaked, pelleting, extruding, popping, drying, pelleting and cubing. There are costs associated with processing, so the improvements in productivity must offset price increases.

Common Nutritional Disorders**

Disorder	**Chief Cause**
Hardware disease	Wire, nails, screws, or metal lodged in reticulum
Ketosis	Negative energy balance when fat is mobilized more quickly than it can be utilized
Acidosis	Excess grain consumption
Grass tetany	Mg deficiency caused by consumption of lush grass
Night blindness	Vitamin A deficiency
Goiter	Iodine deficiency
Rickets	Ca, P, or vitamin D deficiency (young animals)
Anemia	Fe, Cu, vitamin B_{12}, or folic acid deficiency
Founder (laminitis)	Follows a case of acidosis and causes hoof problems
Liver abscesses	Low pH in rumen allows unfavorable bacterial overgrowth, common with low roughage/high concentrate rations
Bloat	Slime producing bacteria increase and slime traps rumen gas. Most common on lush legume pastures
Calf scours	Severe diarrhea
Hemorrhagic Bowel Syndrome	Toxins in fermented feeds