

## Formulating Rations

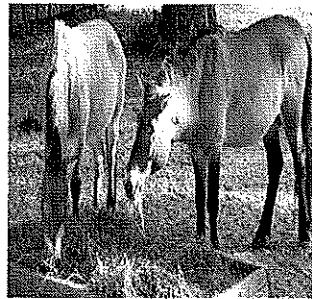


## Ration vs Balanced Ration

- Ration: amount of feed provided for the animal
- Balanced Ration: correct amount of feed that provides adequate nutrition to an animal during a 24 hour period.

## Rations for different purposes:

1. Maintenance
2. Growth
3. Finishing
4. Lactating
5. Breeding and Gestation



## Maintenance:

- Maintain the animals weight and size
- High in carbs and fats
- Low in protein, minerals, and vitamins

Examples: idle work animals, non-producing breeding animals, ones you wish to maintain current weight



## Growth:

- High in protein, minerals, and vitamins

Examples: young market animals, young breeding stock




## Finishing

- Large quantities of carbs and fats
- Ample proteins

Example: feedlot animals going to slaughter soon






### Production:

Fed rations for body maintenance and production.

- High in protein, calcium, phosphorus,
- Fed liberal amounts of feed

Examples: nursing offspring, egg-laying poultry



### Reproduction

- Balanced ration extremely important (especially in the 3<sup>rd</sup> trimester)
- High in protein, vitamins, minerals, carbohydrates

### Work

- Need high carbohydrates, fats, and extra protein
- May use fat stored in body if their ration doesn't meet their needs
- Due to added sweat, they need extra salt in their diet

### 8 essentials of a good ration:

- Balanced Nutrition: equals increased weight gain and greater profit
- Diversified Feedstuffs: allow for ration balancing
- Succulent: fresh and appealing
- Palatable: taste good equals better consumption
- Bulky: ground oats, wheat bran, beet pulp

### 8 essentials of a good ration cont...

- Slightly Laxative: improve efficiency
- Economical: low cost, high quality is good for business
- Suitable for the animal: ruminants need roughages and non-ruminants need concentrates

### Determining Value of Feed

1. Comparing cost per pound of TDN (Total Digestible Nutrients)
2. Comparing the cost per pound of protein
3. Tabular Method – using feed comparison charts that feed manufacturers prepare

### Feed Value:

- Grade of grain
- Species receiving
- Age of animal receiving the grain
- Feed preparation methods
- Moisture content of grain
- Fertility of the soil grain was grown in

### Feed Preparation:

Doesn't increase the feed's value, but...

1. Increases consumption
2. Improves digestion
3. Eliminates waste
4. Increase palatability
5. Makes feed easier to handle

### Common feed preparation methods:

- Grinding: profitable only if it increases consumption and digestion or if it has a hard seed coating
- Cubing and Pelleting: increases consumption, eliminates waste, handles easier, and no special feeding requirement
- Steam Flaking: increases digestibility of milo and corn.

### Feed Additives:

Materials used in animal nutrition to:

- improve feed efficiency
- promote faster gains
- improve animal health
- increase production of animal products

### Hormone Implants:

- Synthetic or natural hormones or hormone-like compounds placed under the skin or in the muscle of the animal
- Used to lower production costs by improving both rate and efficiency of gain

### Performance Stimulants:

- Feed Additives
- Hormone Implants

### Antimicrobial Compounds:

- Antibiotics and chemotherapeutic compounds
- Kill or slow down the growth of some kinds of microorganisms
- Livestock and poultry feed additives

### Subtherapeutic levels of use:

- Use of microbial drugs at a lower level in the feed than would be used for treating sick animals
- Use in cattle has declined

### Major difference:

- Antibiotics: produced by living things
- Chemoantibacterial: compounds made from chemicals
- Chemobiotic: antibiotic and an antibacterial combined into one

### Antibiotics:

- Chlortetracycline (Aureomycin)
- Neomycin
- Oxytetracycline (Terramycin)
- Penicillin
- Streptomycin
- Tylosin

### Ionophores

- Used in ruminants
- Monensin (Rumensin)
- Bovatec
- Both common in cattle

### Chemoantibacterial compounds:

- Carbadex
- Furazolidone
- Nitrofurazone
- Sulfmethazine

### Nutrient-sparing:

- The substance allows animals to use available nutrients more effectively
- Stimulate microbes in the digestive tract to produce more nutrients
- Some thin the intestinal wall to allow easier absorption of nutrients
- Daily intake of feed increase
- Conversion to meat faster
- Control subclinical diseases

### Broad-spectrum antibiotics:

- Control many different microorganisms
- Preferred as feed additives
- Better results in rate of gain, feed efficiency, and improved animal health

### Narrow-spectrum:

- Control only a few microorganisms
- Used to control a specific disease problem that may be present in the group of animals being fed

### Hormones:

- Secreted by: adrenal cortex, pancreas, pituitary, ovaries, and testis
- Regulate: body functions, metabolism, reproduction
- Used primarily in beef nutrition
- Use is very controversial

### Anthelmintics: Dewormers

- Used to control various species of wormer

Examples: hygromycin, loxon, phenothiazine, piperazine, thiabendazole, tramisol

Common worms that infest species:  
roundworms, nodular worms, whip worms

### Other additives:

Coccidiostats: added to poultry rations to prevent coccidiosis

Sodium bicarbonate and ground limestone: used to regulate pH in ruminant stomach

Thyropotein: added to regulate metabolism and the functions of the thyroid

- Poloxalene (Bloat Guard): prevents bloat in ruminants
- Hydroxyzine, reserpine, trifluomeprazine: tranquilizers added to reduce stress on feedlot animals
- Copper compounds: added to improve performance of swine

- Probiotics: change the bacterial population of the digestive tract
- Propionic acid: used to slow development of molds in feed

#### Beef cattle use:

- Major users of additives and hormones
- Increases feed efficiency and rate of gain
- Antibiotics fight microorganisms that cause foot rot, liver abscess, respiratory disease, and shipping fever
- High percent of rations use: Rumensin or Bovatec (both ionophore antibiotics)

#### Hormone implants:

- Improve rate of gain and feed efficiency
- Place all implants in middle 1/3 of ear
- Can't be used with breeding stock

#### Sheep and goat use:

- Not a common practice
- Broad-spectrum antibiotics used in feeder lamb rations
- Ammonium chloride used in goat rations to reduce urinary calculi

#### Regulation of additives:

- FDA regulates
- Current rules found in Feed Additive Compendium

### Feed label requirements:

- Any levels of any drugs must be labeled medicated
- "medicated" must appear under the feed name
- Name and amounts must be listed on tag
- Withdrawal must be printed
- Caution and directions must be given

### Improper Mixing:

- Can cause some animals to get too much and other too little
- Causes drug residue in livestock – be condemned at slaughter
- Use vertical and horizontal mixers
- Clean mixer after each batch

### Health concerns:

- Continued use may result in a resistant strain of microorganisms
- FDA is concerned about possible carcinogenic effects of feed additives

### If we stop using these:

- Raise the cost of animals to the consumer
- Less meat and livestock production
- Higher production costs
- More feed required
- Increase in death loss
- Increase vet bills