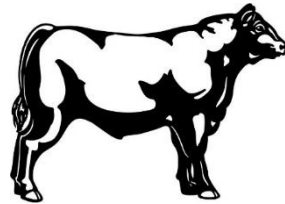
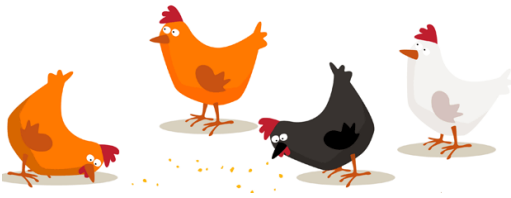


# Ration Formulation



**By: M. Shazaib Ramay**

# RATION

**Certain** amount of feed provided to an animal in a 24-hour period.

**Maintenance**

**Production**

**Correct** amount of feed that provides the proper amount and proportions of **NUTRIENTS** needed for an animal to perform a specific purpose ...



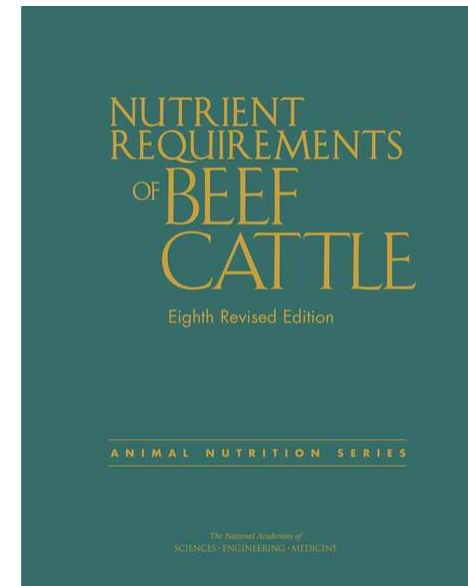
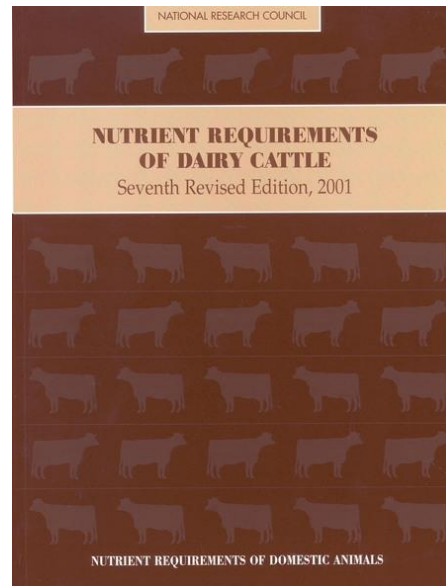
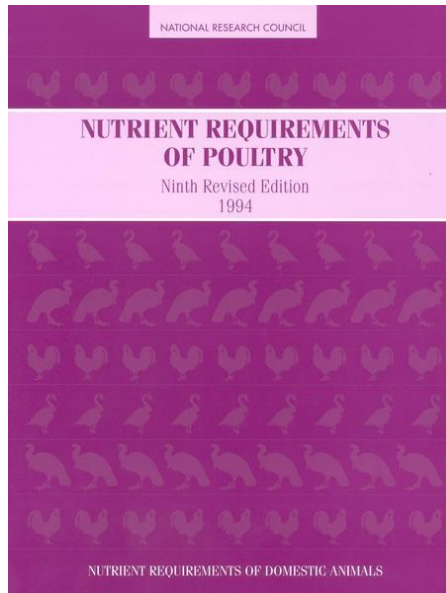
**BALANCED RATION**

# **WHAT ARE THE MATERIALS NEEDED FOR RATION FORMULATION?**

**1. Nutrient requirements  
of Animals**

**2. Nutrient composition  
of feed materials**

❑ For **nutrient requirements** of animals “Feeding standards” are used as guidelines e.g.



❑ **Nutrient composition** of feed material is determined through lab. Analyses i.e. analysis for crude protein, metabolizable energy, fiber content, mineral content (Ca & P).

# FACTORS affecting the Ration Formulation

- Animal related factors: Type of animal; Purpose; Stage of growth
- Feed related factors: Quality; Composition
- Cost related factors: cost of ingredients

## Common types of rations

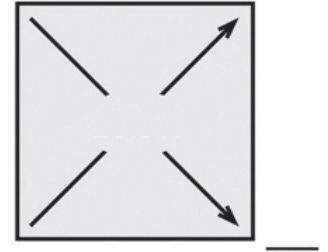
- Starter
- Growth
- Finishing
- Maintenance
- Lactating/ laying
- Gestation/ breeding

## Essentials of good ration

- Balanced and diversified
- Fresh / Appealing
- Palatable
- Bulky/ slightly laxative
- Economical
- Suitable for animal

# Methods of Ration Formulation

## 1. Pearson Square Method



- Simple and quick method used for simple rations
- It can **balance only one nutrient** (generally used for protein or energy balancing)
- Not appropriate to use this method for nutrients like minerals and vitamins

- ❑ Only efficient when **no more than two ingredients** are being used.
- ❑ The value in the middle of the square **must be intermediate between the two values** that are used on the left side of the square.
- ❑ One of the ingredients used must be **higher** in ME or CP than the requirement and the other feed ingredient must be **below** the desired level.
- ❑ Always **subtract smaller number from larger** one along the diagonal lines
- ❑ Nutrient contents of ingredients and nutrient requirements must be **expressed on the same basis** (i.e., dry-matter or “as-fed”). Use dry matter basis then convert it to the as-fed basis.

## **2. Trial and Error Method**

### **INFORMATION NEEDED FOR RATION FORMULATION**

- A. ANIMAL TYPE/ PURPOSE/ STAGE OF GROWTH
- B. NUTRITIONAL REQUIREMENTS
- C. AVAILABLE FEED MATERIAL/ COMPOSITION
- D. FEED MATERIAL INCLUSION RATE
- E. CALCULATION



**Feed material/  
Composition**

**Animal type/ purpose/ age**

Layer and Broiler Rations										
Ration for layer (egg laying stage)										
Ingredients	CP%	ME kcal/kg	Ca %	P %	Quantity %	CP %	ME kcal/kg	Ca %	P%	
Com	8	3400	0.05	0.3	I N C L U S I O N	C A L C U L A T I O N S				
Barley	11	2650	0.07	0.4						
SBM	45	2300	0.25	0.6						
SFM	30	2000	0.4	1						
Molasses	8	1900	0.2	0.03						
Bone meal	8	2000	12	8.6						
CaCO3	0	0	36	0						
DCP	0	0	23	18						
Salt	0	0	0	0						
Vit. Pre.	0	0	0	0						
Min. Pre.	0	0	0	0						
	0	0	0	0						
Total										
Required					Min	16.30	2600.00	3.000	0.600	
					Max	16.70	2700.00	4.000	1.200	

**Animal requirements  
Min/ Max**

# Important considerations for cattle ration formulation

**Ratio of roughage and concentrate** in the ration depends on live weight gain (LWG) and roughage quality.

## **Live weight gain considerations**

- 1000 g/day; above normal,
- 1100-1300 g/day; top level,
- 1400 g/day and higher; highest level

## **Quality consideration of roughage feed in ration**

- If roughage feed in a ration comprises of straw and sugar beet pulp; LOW QUALITY
- If roughage feed in a ration comprises of alfalfa or maize silage; MEDIUM QUALITY
- If roughage feed in a ration comprises of alfalfa and maize silage; HIGH QUALITY

## Roughage and Concentrate Ratio

### Considerations depending on LWG and roughage quality

- ❑ Target LWG 1000g/day and good quality roughage, then of total dry matter intake (%) by an animal: **60% roughage and 40% concentrate**
  
- ❑ Target LWG 1000g/day and low-quality roughage, then of total dry matter intake (%) by an animal: **30-40% roughage and 70-60% concentrate**
  
- ❑ If the target LWG is 1400 g/day, then the ration should contain higher amounts of concentrate feeds

## **As-fed to DM basis**

- i. For example CP of alfalfa on as-fed basis is 17%.
- ii. Its dry matter content is 91%.
- iii. What would be the CP of alfalfa on Dry-matter basis?

$$= 17/91 \times 100 = 18.68\%$$

## **DM to As-fed basis**

- i. For example CP of alfalfa on DM basis is 19%.
- ii. Its dry matter content is 91%.
- iii. What would be the CP of alfalfa on as-fed basis?

$$= 18.68/100 \times 91 = 17.29\%$$



*Thank you!!!*