

BIHAR ANIMAL SCIENCES UNIVERSITY

BIHAR VETERINARY COLLEGE, PATNA

Department of Animal Nutrition

Class: M.V.Sc.

Course No.: ANN-603 (Unit-III)

Date: 28.12.2020 & Time: 10.00 – 11.00 AM

**Formulation of Concentrate Mixture
-Algebraic Method**

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Objective:- To get a desired level of nutrients in a ration by mixing two or more feed ingredients

Ration of Ruminants

- a. Roughage
- b. Concentrate Mixture- (Poultry

Methods used in formulation of concentrate mixture:-

- + Algebraic Method
- + Pearson's Square Method
- + Hit and Trial Method
- + Software based formulation



ALGEBRAIC METHOD

- Sometimes Mathematical equation used for ration formulation.

Example 1:-

A farmer wants to prepare a concentrate mixture containing 20% CP with the combination of maize(8.5% CP) and a protein supplement (40% CP) for feeding a group of animals. Calculate the percentage of these ingredients in a mixture.

Solution-

Given,

Desired CP of mixture = 20%

CP of maize = 8.5%

CP of protein supplement = 40%

Let a = % of maize in mixture

Then,

$100 - a$ = % of protein supplement

Methodology

- CP contribution by maize in mixture = $A \times 8.5/100$ %

if Maize has CP % 8.5 this means:

[by unitary law, if 100 % maize is used - 8.5 kg CP contribution

Then, 1 % acquired - $8.5/100$ kg CP

Then, A % acquired – $A \times 8.5/100$ Kg CP

- Similarly, CP contribution by protein supplement = $(100 - a) \times 40/100$ %

As we known

Total CP of mixture = 20

Then,

$$a \times 8.5/100 + (100 - a) \times 40/100 = 20$$

$$8.5a + 4000 - 40a = 2000$$

$$-31.5a = 2000$$

$$= 63.5$$

Thus, maize in mixture = 63.5%

& protein supplement in mixture = $100 - a$

$$= 100 - 63.5$$

$$= 36.5\%$$

Example 2 :-

A dairyman desires to use to a mixture of barely (10.5% CP), Oats(12 % CP) and Groundnut cake (42% CP) in formulating a mixture with 18% CP for his animals using barely and oats in the ratio of 2 : 1.

Find out the quantities of each of the ingredients.

Solution –

Given,

CP of barley = 10.5%

CP of oats = 12 %

CP of GNC = 42%

CP of mixture = 18 %

Barley : Oats = 2 : 1

Let,

$$\% \text{ of oats} = a$$

Then,

$$\% \text{ of barley} = 2a$$

$$\& \% \text{ of GNC} = 100 - 3a$$

Now,

$$\text{CP contribution by oats in mixture} = a \times 12/100$$

$$\text{CP contribution by barley in mixture} = 2a \times 10.5/100$$

$$\text{CP contribution by GNC in mixture} = (100 - 3a) \times 42/100$$

As we known

Total CP of mixture = 18%

Then,

$$a \times (12/100) + 2a \times (10.5/100) + (100 - 3a) \times (42/100) = 18$$

$$12a + 21a + 4200 - 126a = 1800$$

$$-93a = -2400$$

$$a = 2400/93$$

$$= 25.8$$

Thus,

Oats in mixture = $a = 25.8 \%$

barley in mixture = $2a$

$$= 2 \times 25.8$$

$$= 51.6 \%$$

GNC in mixture = $100 - 3a$

$$= 100 - 3 \times 25.8$$

$$= 22.6\%$$

*Thank
You!*