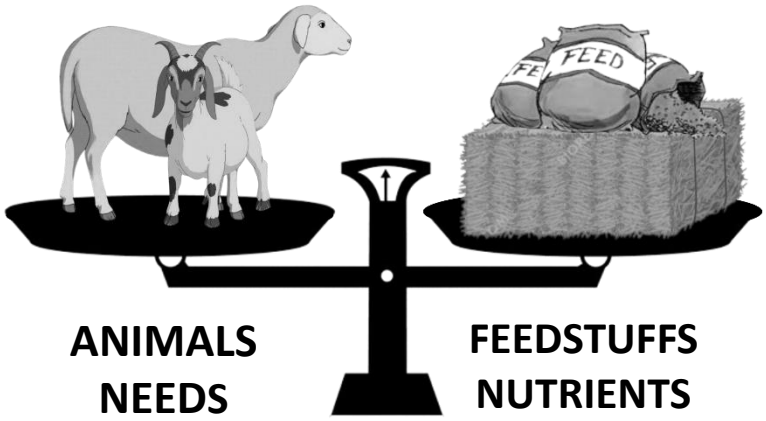
HOW TO BALANCE A RATION



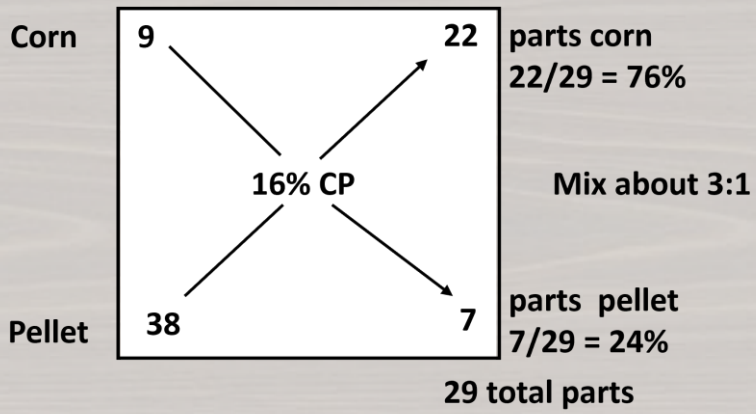
Balancing a ration means formulating a diet that provides all the nutrients an animal requires in the correct amounts and proportions for a 24-hour period. Balanced rations ensure sheep and goats receive adequate energy, protein, minerals, and vitamins without any deficiencies or excesses.

How to balance a ration

1. Determine the animal's needs
2. Analyze feedstuffs
3. Formulate the diet

Nutrient requirements vary by species, breed, size (weight), age, sex, activity, disease status, and production status (and level). There are NRC tables which give these requirements. Rations are usually balanced for energy (TDN), protein (CP), calcium (Ca), and phosphorus (P). Everything is done on a dry matter (DM) basis, as sheep/goats must eat a certain percentage of their body weight on a dry matter basis each day.

Diets can be formulated by hand with pencil and paper. Pearson's Square is a useful tool for balancing rations with only two ingredients. This example is for formulating a 16% CP concentrate mix for feeding lambs using whole corn and a blender (protein) pellet.



There are several online options for formulating rations for sheep and goats. Specialized ration balancing software is also available for more complex formulations. Iowa State University has developed several software modules (BRaNDS) for balancing sheep and goat rations.

Stage	%DM	%TDN	%CP	Ca, g	P, g
Maintenance	1.7	53	7.3	2.4	2.0
Late gestation	2.6	66	10.0	8.8	5.3
Lactation	2.8	66	15.5	7.9	6.9
Growing lamb	2.75	75.9	14.5	0.51	0.24
Dairy ewe	3.35	79.5	19.2	12.4	10.3

NRC, 2007

Feedstuffs differ in the amount of nutrients they contain. Some feedstuffs are high in energy; other are high in protein. Forages and by-product feeds vary in their nutrient composition and should be tested for nutritive content, whereas published "book values" can usually be used for grains and other common feed supplements.

Feedstuff	DM	TDN	CP	Ca	P
Corn	88%	88%	9%	0.02	0.3
Distiller's grains	90	92	29	0.15	0.78
Soybean meal	91	84	49	0.36	0.7
Alfalfa hay	89	58	17	1.4	0.24
Soyhulls	90	77	13	0.6	0.19

NRC, 2007

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