

FEEDING FOR FERTILITY

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It is necessary to evaluate stallions as individuals. Age, book, behaviour, body condition, general health and amount of exercise determine how a sire should be fed. Some are ridden, trained, travelled and competed during the breeding season; stallions at pasture vary greatly in their activity level; others are confined and sedentary, except for trips to the breeding facility.

During the off season, stallions not being ridden or kept in show condition, can be maintained on good quality hay or pasture - as long as their body condition is acceptable. Improved pasture, grass hay at 1.75 to 2.5% or top-quality lucerne at around 1.5 to 1.75% of body weight will meet protein and energy requirements. To cover all vitamin, mineral and essential amino acid deficiencies, supplements are needed. Stallions being ridden or competing and those that are underweight, should be fed the same as a breeding stallion and need a concentrate in addition to the roughage. The concentrate is usually required at around 0.5% of body weight per day.

The stallion is subject to the same seasonal influences as affect the breeding cycles of the mare: his fertility is greatest in summer and least in winter. There is some evidence that improved fertility early in the season may be obtained by following a feeding regime similar to that proposed for mares, in which artificial light and a richer food are provided in late July and August. At no time should the stallion be allowed to fatten and higher fibre, but balanced feeds are sufficient outside the breeding season. Poorer quality hay supplemented with a nutritionally balanced concentrate is suitable in the non-breeding season and will allow the introduction of a rising plane of nutrition as the breeding season approaches. Several months before the season starts better quality hay can be used with the balanced concentrate.

Breeding stallions must be well presented and able to complete the season without excessive weight loss. Feed intake may need to be adjusted to maintain bodyweight during the busiest part of the season. Stallions should be managed so that they enter the breeding season in good condition - a body condition score of 3 - 4. (see table).

SCORE	Condition	Neck	Withers	Loin	Tailhead	Ribs	Shoulder
0	Very Poor	Ewe neck, vertebrae visible	Pronounced backbone and withers	Prominent, spine bones	Deep cavity under tail, hip bones visible	Prominent with skin furrows between	Bone structure very prominent
1	Poor	Ewe neck, vertebrae visible	Prominent backbone, slight cover	Spine processes covered	Cavity under tail, croup visible	Slight depression between ribs	Bone structure visible, some fat cover
2	Moderate	Narrow, vertebrae covered	Backbone and withers covered	Spine well covered	Flat rump Tail head slightly soft	Ribs just visible	Shoulder not thin blending into body
3	Good	Firm, no crest	Smooth and round	Slight crease	Round rump, tail head soft	Ribs covered, easily felt with fat cover	Well covered, fat can be felt
4	Fat	Wide firm slight crest	Gutter along back, fat over withers	Crease down back	Well rounded	Ribs well covered, hard to distinguish	Fat deposits behind shoulder
5	Very Fat	Marked crest	Not visible	Deep gutter	Bulging rump	Ribs buried	Bulging fat

During the breeding season, most stallions need a total daily feed of 50 - 70% roughage and 30- 50% concentrate. This will be determined by individual differences, hay or pasture quality and energy density of the concentrate. Almost any concentrate feed will meet the stallions energy requirements, but some would have to be fed in such large quantities that digestive tract well-being and health could be compromised. On the other hand, some concentrates are so energy- dense that very small amounts of feed will meet the vitamin, trace mineral and essential amino needs not provided by grazing or hay. The nutrient requirements of the breeding stallion are about 25% greater than during the off season. Breeding activity plus exercise make energy and nutrient requirements comparable to those of a mature horse in light work.

DAILY NUTRIENT REQUIREMENTS OF STALLIONS				
Body Weight	Status	Energy (MJ)	Protein (grams)	Vitamin E (iu/kg of feed)
400kg	Off-season	56	536	50
	Breeding	70	670	80
500kg	Off-season	69	656	50
	Breeding	86	820	80
600kg	Off-season	82	776	50
	Breeding	102	970	80

A diet of 0.75 to 1kg of concentrate per 100kg of bodyweight, plus hay, will meet all requirements, provided the concentrate is correctly formulated.

However, the energy density of the feed affects the level of feed intake. If a concentrate of low nutrient density is fed, a larger amount is required. Stallions may have difficulty getting enough energy with low energy-dense feeds. Fat-supplemented concentrates can be beneficial for maintaining older stallions that may be thin, those being pasture-bred, stallions in training and for extremely active horses - such as those that walk the fence-line.

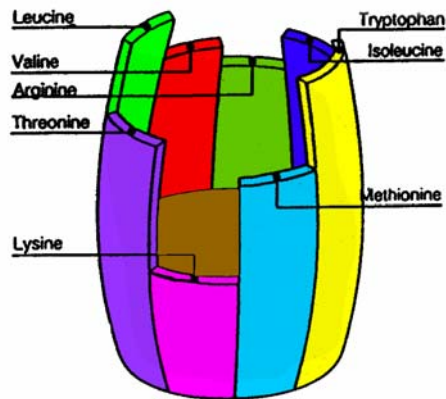
Extruded, fat-supplemented feeds provide even more energy than a traditional concentrate, reducing the weight of feed required per day. Stallions usually do better on a concentrate- containing less than 9% fibre. Such feeds are more energy-rich than higher Fibre feed and will maintain body condition with less feed.

THE EFFECT OF ENERGY DENSITY ON DAILY FEED INTAKE				
Weight of concentrate needed per day, with 5kg hay, to meet energy requirements.				
Body Weight	Oats/Pellets (12MJ)	Barley (13MJ)	Corn (14.5MJ)	Energy-dense feed (17MJ)*
400kg off-season	1.75	1.7	1.5	1.3
400kg breeding	2.9	2.7	2.4	2.1
500kg off-season	2.8	2.6	2.3	2
500kg breeding	4.25	3.9	3.5	3
600kg off-season	3.9	3.6	3.2	2.8
600kg breeding	5.6	5.1	4.6	3.9

The exact composition of the diet will be affected by the nutrient content of the hay or pasture and the energy density of the concentrate. Owners and managers should never hesitate to contact the feed manufacturer for additional nutrition information. Even the best formulated feeds can fall victim to poor feeding management, resulting in horses that are too fat, thin, foundered or prone to disorders of the digestive system. Regardless of the diet, stallion owners should monitor feed intake carefully. Stallions should be fed individually. When daily grain or concentrate intake exceeds 0.5% of body weight (2kg for a 400kg stallion, 2.5 for 500kg and 3kg for a 600kg sire) the total daily amount should be divided into 2 or more feeds.

A correctly balanced concentrate will maintain weight and breeding activity and also meet protein, mineral and vitamin requirements. When low-protein hays, such as grass or meadow bay, are fed a higher protein concentrate or greater quantity of concentrate is required. However, feeding excess protein is not economical. The excess protein serves no benefit and will contribute to stable ammonia levels. The ratio of energy to protein is important and if hay or pasture is high in protein, a smaller amount of concentrate should be used to avoid excess protein. The total protein intake, measured in grams per day is critical. The percent protein is only important in that when multiplied by the weight of feed, it indicates the total grams of protein fed.

Body composition is also important. If all essential amino acids and minerals are not supplied in the diet, then muscle development will be reduced and horses will have more 'cover', ie. fat. Whether muscle or fat is laid down depends on the amino acid composition of the feed. Each protein in the body has its own recipe of amino acids. Think of each amino acid as a wooden slat in an old-fashioned water barrel.



The barrel can only hold water to the level of the shortest slat. Similarly, the amount of protein the body can build is limited by any amino acid deficiencies. Regardless of the % protein in the feed, if there is not enough of each amino acid then each particular body protein cannot be made. Protein synthesis is a bit like cooking! If one ingredient is deficient or missing, the others cannot be used, are degraded to fat and stored under the skin. The horse will lay down cover (fat) instead of building muscle.

However, feed digestion **must** occur in the small intestine where enzymes release individual amino acids for absorption. Feeds not well digested pass into the caecum and ferment - proteins are degraded to ammonia and the amino acids are lost to the horse. Oats and sunflowers growing in manure show that a large % of raw feed passes through undigested - making for very expensive manure. Raw grains are only 50% digested. Steam-extrusion increases digestion in the small intestine to over 90%.

Young stallions are still building and remodelling bone. A balanced concentrate ensures that the young skeleton is not compromised by dietary mineral and amino acid imbalances. Even in older stallions, skeletal bone density must be maintained. The calcium to phosphorus ratio must be correct. One of the reasons that calcium must be greater than phosphorus is that calcium is only absorbed in the small intestine. Any calcium not absorbed in the small intestine passes out in the manure. Phosphorus is absorbed in both the small and large intestines. To be adequate, concentrates must contain at least 0.45% calcium and 0.35% phosphorus.

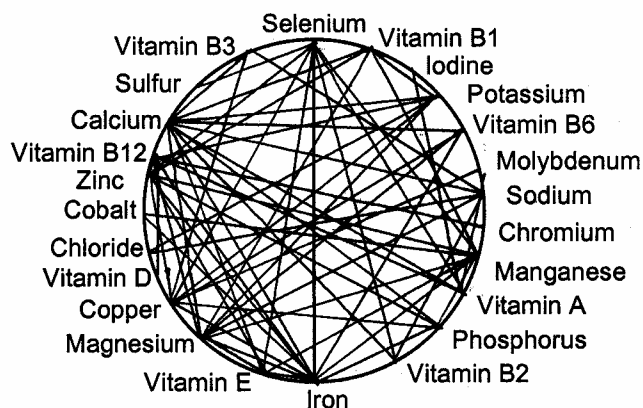
There are plenty of examples of common feeding practices, which fail to meet horses requirements by providing either deficient amounts of some nutrients, excess of others, or both. Grains contain more phosphorus than calcium, as does bran. This inverted ratio often remains uncorrected. Although lucerne is high in calcium, it cannot be assumed that this will balance the deficiency in grain - the calcium in lucerne is only about 48% available - meaning that over half of the calcium in lucerne cannot be absorbed. Many pasture grasses contain oxalates which prevent calcium and phosphorus absorption and if

grazing kikuyu and other subtropical grasses, horses may require up to 100 grams of calcium per day to prevent deficiency.

There is little evidence to support the use of special supplements to enhance fertility. It is uncertain whether nutrition affects semen quality and quantity. It does affect stallion health and the cost of feeding a correctly balanced feed is often less than feeding incorrectly and attempting to balance the diet with multiple supplements. Contrary to common belief and myths, breeding horses do not require vitamin A beyond recommended levels. Neither does vitamin E have a beneficial effect on libido or sperm quality. Correctly formulated feeds from reputable companies contain required levels of these vitamins. Prepared feeds are usually economical, compared to hand mixing grains and legumes and then adding several different supplements in an effort to meet individual vitamin and mineral requirements.

A factor often overlooked when using several different supplements is the tendency for minerals and vitamins to interact with each other. The chart shows some known interactions.

MINERAL AND VITAMIN INTERACTIONS



Because of the variables, stallion owners are challenged to provide a diet with balanced mineral composition. Grains, chaff, hay and pasture are all deficient in vitamins, minerals and trace elements, so it is necessary to supplement most diets. However, the balance must be correct. Borderline imbalances and deficiencies may not affect overall general health - instead they cause reduced fertility, abnormal growth, failure to reach potential, bone, joint, ligament, tendon and birth weaknesses and defects, poor performance, breakdowns and injuries. When several supplements are used the risk of overlap, excesses, deficiencies and imbalances increases.

Anabolic steroids are sometimes used to gain an advantage in competition or the sale ring. However, reduced growth, altered sexual behaviour, decreased scrotal width, a 40 to 60% reduction in testicular weight and a fall in sperm

motility and numbers have been reported following steroid administration. Anabolic steroids may make stallions eat more and behave aggressively but they reduce fertility.

On average, the Australian Stud industry feeds 1.33 ton of feed per horse per year - equal to 3.64kg per horse per day. At MITAVITE, agricultural scientists, equine nutritionists and veterinarians combine their fields of knowledge and expertise to formulate the Mitavite range of stud feeds. Mitavite Promita has been developed to balance pasture, grain and traditional diets - supplying minerals and essential amino acids in the correct ratios and balance. Mitavite Breeda is a complete feed, formulated to be fed with roughage. Using steam-extrusion, protected, heat-stable vitamins and chelated mineral proteinates Mitavite feeds are formulated to support and protect genetic potential.