



## Feed Budgets for Horses

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During drought, the availability of hay and other roughage feed is often limited. Not only is it hard to source, but the price of hay may double or even treble! It is therefore vital that horse owners plan their resources for the drought period and for some time afterwards, including through the winter months, until significant grass growth begins which is not usually until the following Spring.

Creating a feed budget initially for a day will tell you how much feed you will need for your horse(s) per day/week/month, and then you can estimate how much feed you will need and an approximate cost to feed them until the next Spring.

To create a feed budget, there are 6 steps you need to take:

### Step 1:

Estimate the weight and condition score of each horse (refer Condition Scoring and Weight Estimation of Horses Agnote AG0928 or use a weigh tape).

### Step 2:

Separate your horses into categories (refer columns 1 and 2 of Table 1).

### Step 3:

Determine the nutritional needs of each horse (refer Table 1).

### Step 4:

Ascertain the nutritive values of common feeds (see Table 2).

### Step 5:

Determine how much feed each horse can consume daily. This enables you to calculate if certain feeds can be consumed in sufficient quantities to provide the required nutrition.

Horses are able to consume about 1.5 - 2% of their body weight in dry feed (feed that is 90% dry matter) each day, (ie 1.5 - 2 kg per 100 kg of the horse's body weight). However it is safer to use 1.7% of body weight (or 1.7 kg per 100 kg of body weight) to calculate a feed budget, to ensure that the horse can consume the full amount of feed each day.

To calculate how much feed each horse can consume daily, use the following example:

$$\frac{1.7 (\% \text{ of bodyweight}) \times 500 (\text{kg horse})}{100} = 8.5 \text{ kg max feed}$$

(In this example the horse weighs 500 kg, so it can safely consume up to 8.5 kg of dry feed per day.)

### Step 6:

Calculate a feed budget for each horse:

- Note energy requirement of horse using Steps 1, 2 and 3.
- Note energy content of feedstuffs in Step 4.
- Calculate the horse's maximum feed intake (Step 5).
- Match horse energy needs to energy supplied by type of feed. (Use example calculations at end of this Agnote).
- Ensure the horse can consume enough feed (is the feed amount equal to or below your calculation in Step 5?)
- Ensure that at least 70% of the feed is roughage (hay, pasture or chaff).

### Important Notes:

**Note 1:** Ensure the horse has free access to good quality water to drink.

**Note 2:** Ensure protein requirements are met, refer table 2 for protein content in various feeds. Protein-rich supplements, such as lupins or soybean meal, can be added to increase protein content of the feed.

**Note 3:** With cold wet weather maintenance feed levels increase and decrease to normal requirements as it becomes warmer.

**Note 4:** When lucerne hay is the main feed used, a phosphorous supplement may be needed to balance the high level of calcium present in lucerne hay. Consult an equine nutritionist for further information.

**Note 5:** Introduce changes to feed gradually, over 3-5 days, as a sudden change in diet can cause colic or laminitis.

**Note 6:** Where an increase in horse body weight is required, a maximum of 10% increase in feed amount should be used. More than this amount could be detrimental to the horse. Visual appearance of body weight gain can take several months.

**Note 7:** Concentrates such as grains should make up a maximum of 30% of a horse's diet, and should be introduced gradually.

### Handy Hints:

**Hint 1:** Addition of a vitamin and mineral supplement is recommended to ensure a balanced diet.

**Hint 2:** Maintain a dental and worming program to enable the horse to process the feed efficiently.

**Hint 3:** Vegetable oil (or canola, corn or sunflower oil) can be used to add extra fat to the diet. As a guide, 250 ml

(1 metric cup) of oil is roughly equal to 2.5 kg oats. No more than 500 ml (2 cups) of oil should be fed per day. Introduce oil into diet slowly (50 ml increase per day until desired daily amount is reached). Mix into feed just before feeding to avoid rancidity. Oils can also help to minimize dust levels in the feed.

**Hint 4:** Prepared horse feeds can be incorporated into a feed budget by reading the label and factoring in the energy (MJME or DE) and protein content.

**Table 1. Daily energy and protein requirements for different categories of horses. (from Nash, 1999).**

Type of Horse	Mature weight (kg)	Daily gain liveweight (kg/day)	Digestible energy (DE) (MJ)	Crude protein (g)
<b>Weanling</b> (4 months)	400	0.85	56.5	675
	500	0.85	60.2	720
	600	1.00	69.0	825
<b>Weanling</b> (6 months, moderate growth)	400	0.55	54.0	643
	500	0.65	62.8	750
	600	0.75	71.1	850
<b>Weanling</b> (6 months, rapid growth)	400	0.70	60.7	725
	500	0.85	72.0	860
	600	0.95	80.3	960
<b>Yearling</b> (12 months, moderate growth)	400	0.40	65.3	700
	500	0.50	71.9	851
	600	0.65	95.0	1023
<b>Yearling</b> (12 months, rapid growth)	400	0.50	71.5	770
	500	0.65	89.1	956
	600	0.80	105.0	1127
<b>18 months old</b>	400	0.25	66.5	716
	500	0.35	82.8	893
	600	0.45	100.00	1077
<b>2 years old</b>	400	0.15	64.0	650
	500	0.20	78.7	800
	600	0.30	98.3	998
<b>Maintenance</b>	400		56.1	563
	500		68.6	656
	600		81.2	766
<b>Pregnant</b> (9 months)	400		62.3	654
	500		76.1	801
	600		90.0	947
<b>Pregnant</b> (10 months)	400		63.2	666
	500		77.4	815
	600		91.6	965
<b>Pregnant</b> (11 months)	400		67.4	708
	500		82.4	866
	600		97.5	1024
<b>Lactating</b> (foaling to 3 months)	400		95.8	1141
	500		118.4	1427
	600		141.0	1711
<b>Lactating</b> (3 months to weaning)	400		82.4	839
	500		101.7	1048
	600		120.9	1258

**Table 2. Nutritive values of common feeds. (adapted from Nash, 1999, Kohnke, 1999 and Huntington et. al. 2004).**

Feed type	Energy as fed	Crude Protein
	(MJ/kg) (DE)	(g/kg)
	Average	Average
Wheat	14	114
Triticale	13	140
Maize	14	90
Barley	13	100
Lupins	14	300
Peas	14	230
Oats	12	90
Tick beans	13	255
Lucerne hay/chaff	8	170
Clover hay	8	120
Meadow/grass hay	7	90
Oaten hay/chaff	7	80
Cereal straw	5	40
Perennial ryegrass (summer)	9	100
Perennial ryegrass (winter)	12	220
Phalaris (summer)	9	100
Phalaris (winter)	12	220
Annual pasture (summer)	5	70
Annual pasture (winter)	10	150

**Example Feed Budgets:**

**Combinations of feeding lucerne hay, pasture hay and oats for horses of different weights.**

Assume: Meadow hay = 7 MJME/kg (protein 90g/kg)

Lucerne hay = 8 MJME/kg (protein 170g/kg)

Oats = 12 MJME/kg (protein 90g/kg)

See detailed calculations of example budgets below.

**400 kg horse, maintenance**

Requires 56 MJME per day

Requires 563 g protein per day

Max dry feed intake/day 7 kg (approx)

Feed type	kg/day	Oats added (kg/day)	Total kg/day
Pasture Hay (100%)	8		8*
Pasture Hay (90%)	7.2	0.5	7.7*
Pasture Hay (70%)	<b>5.6</b>	<b>1.4</b>	<b>7</b>
Lucerne Hay (100%)	<b>7</b>		<b>7</b>
Lucerne Hay (90%)	<b>6.3</b>	<b>0.5</b>	<b>6.8</b>
Lucerne Hay (70%)	<b>4.9</b>	<b>1.4</b>	<b>6.3</b>

\* Too much bulk for horse to eat per day. Reduce roughage and add higher energy supplement (eg grain and/or vegetable oil).

**500 kg horse, maintenance**

Requires 69 MJME per day

Requires 656 g protein per day

Max dry feed intake/day 8.5 kg (approx)

Feed type	kg/day	Oats added (kg/day)	Total kg/day
Pasture Hay (100%)	9.8		9.8*
Pasture Hay (90%)	8.9	0.6	9.5*
Pasture Hay (70%)	<b>6.9</b>	<b>1.7</b>	<b>8.6</b>
Lucerne Hay (100%)	<b>8.6</b>		<b>8.6</b>
Lucerne Hay (90%)	<b>7.8</b>	<b>0.6</b>	<b>8.4</b>
Lucerne Hay (70%)	<b>6</b>	<b>1.7</b>	<b>7.7</b>

\* Too much bulk for horse to eat per day. Reduce roughage and add higher energy supplement (eg grain and/or vegetable oil).

**600 kg horse, maintenance**

Requires 81 MJME per day

Requires 766 g protein per day

Max dry feed intake/day 10 kg (approx)

Feed type	kg/day	Oats added (kg/day)	Total kg/day
Pasture Hay (100%)	11.6		11.6*
Pasture Hay (90%)	10.4	0.7	11.1*
Pasture Hay (70%)	<b>8.1</b>	<b>2</b>	<b>10.1</b>
Lucerne Hay (100%)	<b>10.1</b>		<b>10.1</b>
Lucerne Hay (90%)	<b>9.1</b>	<b>0.7</b>	<b>9.8</b>
Lucerne Hay (70%)	<b>7.1</b>	<b>2</b>	<b>9.1</b>

\* Too much bulk for horse to eat per day. Reduce roughage and add higher energy supplement (eg grain, oil).

**Example Calculations**

Examples are for a **500kg horse, maintenance.**

Requires 69 MJME per day

Requires 656 g protein per day

Can eat max 8.5 kg dry feed per day (approx)

**Scenario 1: Feeding 100% lucerne hay:**

If lucerne hay = 8 MJME / kg, (170 g protein / kg)

1) Convert MJME requirement to kg:

Daily horse MJME requirement (69)

$$\text{Feed MJME / kg content (8)} = \mathbf{8.6 \text{ kg hay per day.}}$$

2) Protein calculation:

$$\text{Kg hay (8.6) x protein content (170) = 1462 g}$$

Is this horse able to eat 8.6 kg hay per day? Yes.

Does the protein meet the horse's needs? Yes.

**Scenario 2: Feeding 90% Lucerne hay and 10% oats**

If lucerne hay = 8 MJME / kg, (170 g protein / kg)

If oats = 12 MJME / kg, (96 g / kg)

1) Calculate horse's energy requirement of each feed type:

$$\mathbf{\text{Hay: } 90\% \text{ of } 69 \text{ (horse daily MJME requirement)}}$$

$$= \mathbf{62 \text{ MJME per day in lucerne hay, minimum.}}$$

**Oats:** 10% of 69  
= 7 MJME per day in oats, maximum.

2) *Convert above MJME requirements to kg:*

**Hay:** Horse MJME requirement (62)  
Feed MJME/kg content (8) = 7.8 kg hay daily

**Oats:** Horse MJME requirement (7)  
Feed MJME/kg content (12) = 0.6 kg oats daily

$7.8 + 0.6 = 8.4$  kg total feed per day.

3) *Protein calculation:*

Kg hay (7.8) x protein content (170)  
+ Kg oats (0.6) x protein content (90) = 1380 g protein.

Can this horse eat 8.4 kg feed per day? Yes.

Does the protein content meet the horse's needs? Yes.

### Note:

The calculations and figures in this document vary between horses and feedstuffs. It is recommended to obtain a feed analysis to ensure accurate estimation of nutrient content. A qualified equine nutritionist or an equine veterinary practitioner should be consulted for advice specific to your needs.

Other factors that may contribute to a horse's weight gain/loss include amount of available pasture, palatability of feeds, horse health and metabolism, weather conditions and wastage of feed.

Feed budgets can provide guidelines only. Constant re-assessment of the horse's condition needs to be made to ensure the feed quantity and nutrient content matches the horse's requirements.

### More information:

If unsure about any aspect of your horse's requirements or your proposed feed budgets it is suggested that you contact one of the following for expert advice:

Department of Primary Industries Customer Service Centre, phone: 136 186, email: [customer@dpi.vic.gov.au](mailto:customer@dpi.vic.gov.au)

Department of Primary Industries website:  
[www.dpi.vic.gov.au/farming/horses](http://www.dpi.vic.gov.au/farming/horses)

An equine veterinary practitioner

An equine nutritionist (there are a number of qualified equine nutritionists in Victoria associated with major horse feed companies).

### Acknowledgements:

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### References:

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- Huntington, P., Myers, J. and Owens, E. (2004) Horse Sense, the Guide to Horse Care in Australia and New Zealand (2<sup>nd</sup> ed). Landlinks Press, Collingwood, Australia.

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