

Improving muscle mass in horses

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A loss of muscle mass is a common phenomenon in aging humans, and has also been documented in aging horses, often due to a decline in activity, poor teeth, and a decline in the ability to digest protein, increasing the dietary protein needs of the aged horse. One way of getting around this is to increase the quantity of crude protein in the diet, however this may have metabolic disadvantages. As an alternative, the “quality” of the protein could be improved.

Protein is the major structural component of muscles, blood and many other tissues. Different types of proteins consist of different combinations and numbers of amino acids. Proteins composed of a high proportion of “essential amino acids” are referred to as *high-quality proteins*. By improving the protein quality of the equine diet, irrespective of age, the horse is able to maintain muscle mass better.

So how do you improve protein quality? Some protein feeds have a higher “protein quality” than other as shown in the table below:

Table 1. Amino acid composition of common protein sources. The feeds that contain the highest and second highest levels of each of the amino acids are shown in red/bold and blue/italics respectively.

	Lucerne	Soyabean meal	Copra (coconut)	Cottonseed meal	Lupins	Sunflower	Canola
Arginine	7.1	<i>32.3</i>	23.8	42.6	33.8	23.8	22.1
Histidine	3.7	11.7	3.9	<i>11.1</i>	7.7	6.6	9.6
Isoleucine	6.8	19.9	7.5	12.9	14.0	12.9	<i>14.3</i>
Leucine	12.1	34.2	13.6	24.5	24.3	18.6	<i>25.8</i>
Lysine	7.4	28.3	5.8	16.5	15.4	10.1	<i>20.8</i>
Methionine	2.5	6.1	3.5	<i>6.7</i>	2.7	5.9	7.4
Phenylalanine	8.4	21.8	8.4	<i>19.7</i>	12.2	12.3	14.3
Threonine	7.0	17.3	6.7	13.4	12.0	10.4	<i>15.9</i>
Tryptophan	2.4	6.1	1.9	<i>5.4</i>	2.6	3.8	4.5
Valine	8.6	20.6	10.7	17.6	12.9	14.9	<i>18.2</i>

As shown in table above, the protein meal that contains the highest levels of the essential amino acids is soyabean meal, however it contains lower levels of arginine. Cottonseed meal and canola meal also provide good levels of some of the amino acids, but are better utilized in combination with other protein meals. Copra and sunflower contain relatively low levels of essential amino acids, and are therefore unsuitable as the sole protein source in growing foal and some adult horse rations.

For optimizing growth of foals, and maintenance of muscle mass in older horses, use of protein supplements manufactured by one of the many feed manufacturers may be beneficial. These supplements are usually based on one of the above protein meals, but are normally fortified with amino acids that might be lacking. Each supplement varies according to amino acid profile, levels of vitamins and minerals and cost. For further information on this topic, please contact Equine Consulting Services at any time.