

Understand the energy content of feed .

It is important to know the energy content of the feed we give our horses. If a horse takes in more energy than it expends, it will grow fat. Too little energy coming in and the horse will lose weight. Most countries have adopted units for energy in feeds but, because of differing traditions, the official units vary between countries. This often creates problems when concentrate mixtures from England or Germany are marketed, for example, in Scandinavia or France, since the latter may use other energy units than those used in the country of origin.

In this article we shall help explain these differences, and enable readers to obtain proper Labelling of energy content when they buying your feed and what your horse may require.

Gross energy

Gross energy is the energy released when a feed is burned, as in a laboratory oven, and only the ashes remain. Gross energy says little about the feeds energy value for the horse however. This is because the body's metabolism, which takes place at body temperature, is far less complete than combustion in a furnace. After the horse has eaten and digested a given quantity of a food, there will be losses in the form of faeces, urine, intestinal gases and heat. What are the units used to measure the energy content of horse feeds? Losses are energy-containing, they have to be accounted for in a horse's energy balance. While gross energy of a feed can be measured easily in the laboratory, costly digestibility experiments are needed to determine how much energy any horse can obtain from a feed.

Digestible energy



The easiest way to express the energy value of feeds is as digestible energy. In digestibility experiments the horse is given a certain amount of a feed for several days. All faeces is collected and its energy value is measured. The digestible energy of the feed is the difference between the gross energy of the feed and the energy in the collected faeces.

In Ireland , England and Germany the energy content of horse feeds is given as units of digestible energy. The unit used is MJ (Megajoules). In the USA the unit is MCal (Mega calories). Conversion is done using the formula: 1 MCal = 4.185 MJ.

Metabolisable energy

Since energy is also lost through urine and intestinal gases, we can go a step further in the calculation of a feed's energy value by subtracting these energy losses too. Then we get what is called metabolisable energy. This represents the portion of the energy from the feed that is available for the body's many functions. Metabolisable energy provides a more accurate measure of a feed's energy value for the animal than digestible energy.

Net Energy

Net energy is even more complicated to measure. When, in addition to energy losses via faeces, urine and intestinal gas we also measure the energy costs of digestion processes and the turnover of nutrients absorbed from the diet, we get what is called the feed's net energy. This represents the portion of feed energy that can be used by the horse for work, for growth, for the production of a foetus or milk and for the maintenance of the body.

In Norway, Denmark, Iceland, the Netherlands and France, the feed energy is given as net energy. The unit is feed units for horses, called FEh in Scandinavia, EWpa in the Netherlands and UFC in France. Conversion between net energy given as MJ and as FEh is done with: $FEh = MJ / 9.414$.

The factor 9.414 is the net energy content of 1 kg barley when utilized by the horse.

We express the net energy content of all other feeds relative to the energy value of 1 kg of barley. If 1 kg hay has a net energy value 0.5 FEh, this means that one kg of that hay has half as much net energy as 1 kg barley. A schematic representation of the differences between the various ways of expressing the energy content of horse feeds is shown in the chart below.

What will be the difference in energy values calculated according to the different systems? It is very helpful to know how much energy values change when we go from digestible energy to metabolise energy and to net energy. From digestible energy (DE) to metabolise energy (ME) For concentrates: Energy value in MJ (ME) is reduced to about 89% of the MJ given as DE. For forage: Energy value entered as MJ (ME) is reduced to about 85% of the MJ (DE). From metabolise energy (ME) to net energy (NE) For concentrates: Energy value in MJ (NE) is reduced to approximately 78.5% of MJ (ME). For forage: Energy value in MJ (NE) is reduced to about 59% of MJ (ME). When we calculate net energy from metabolise energy, we first get an energy measurement as MJ. To calculate that energy as feed units for horses, we must, as noted, divide the MJ value by the energy content of 1 kg barley (9,414 MJ). Why is it important to be aware of the different ways of expressing the energy content of feeds?

Today many horse feeds are sold in a number of different countries. Concentrates especially are sold across borders. Concentrate mixtures produced in, for example, England or Germany can often be bought in countries such as Sweden, Denmark and Norway. Feeds produced in Sweden are sold in Denmark, Norway and other European countries. Since most of these concentrate mixtures are sold in bags printed up in the country of production, it requires knowledge of foreign energy units to correctly understand the energy content and to be able to recalculate to the units used in your country. Is this complicated? Yes, it is difficult to understand the different systems and how to correctly recalculate between them. PC -Horse has taken this problem seriously and now offers automatic conversion of energy values of feeds sold in several countries. The PC-Horse team aim to increase the number of agreements with feed producers and importers, in order to enter new brands into our feed database. The energy content of feeds which download to the PC -Horse program will be presented to the program user with correct energy units for the user's country - a great help to both importers and horse owners alike. What does this mean in practice? Daily intake of roughage varies based on feed quality, production classes, individual appetite and each individual's place in the herd hierarchy. This means that we must observe horses in a herd closely and make corrections to the feed offered each individual at night-time or early morning to avoid some individuals growing too fat or too thin. For more information about using the correct feeds using PC Horse dietary support with Pegus Horse Feed go to www.pegus.ie and check diet request.

