What are the forage options for high yielding dairy cows?

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Cows convert stuff into milk. This is the foundation of our dairy industry. The goal is to provide cows with palatable, high quality stuff as economically as possible. It does not matter what the stuff is as long as it meets the needs of the animals. Grass, grass silage, maize silage, lucerne, wholecrop cereals, brewers' grains etc. can all be incorporated into a balanced feed for cows.

The rumen is a complex fermentation chamber that can handle almost anything. It must be managed carefully to achieve maximum efficiency. The rumen microbes require a steady supply of energy, protein and essential trace nutrients throughout the day. Maximising their growth will ensure excellent fibre digestion and will avoid rumen upsets such as acidosis.

Long fibre is essential for rumen function. It drives cud chewing which is essential for rumen health. Cud chewing promotes mixing of all the rumen contents. Fine particles would otherwise settle out on the floor of the rumen and because they are fermented quickly, could cause acidosis and rumen scarring.

The rumen has a limited capacity. Top cows may need 50% more energy than the average cow but may only be able to eat 20 to 30% more. Energy is the hardest requirement to meet. This is why it is so important to provide high yielding cows with the best quality forage. Everyone has experienced the change in performance when moving onto better silage or an aftermath paddock.

Soil type, rainfall, elevation, temperature and availability of by-products will determine which forage options are best on each farm. The key thing is to go for the forage that can consistently provide the highest energy at a reasonable cost. Average analysis results from 2005, tested in Agriking's laboratory, are shown below. (See Table 1).

TABLE 1

	Grass	Grass silage	Maize silage	Wholecrop silage	Lucerne silage	Pea silage	
DM	18.9	24.1	30.3	38.9	32		31.2
CP	24.7	13.7	8.9	10.9	17.7	18.5	
NDF	44.6	55.8	48.1	45.4	47.5	41.2	
IVDMD	83.5	68.6	70.6	69.5	68.2	72.4	
NFC	26	19.7	41	42	22		32
Calcium	0.7	0.64	0.29	0.25	1.24	0.97	
Phos	0.35	0.31	0.25	0.19	0.38	0.39	

These averages hide a large variation between areas. On very heavy, wet soil, maize and lucerne will not work. On dry sites, mid-season grass growth may be very poor. Vegetable, distillery and milling by-products are plentiful and cheap in certain areas, although consistency of quality and supply are critical.

Maize silage

On average, maize silage has the highest digestibility and therefore energy content. Also, the high starch and sugar content makes it an excellent supplier of energy for the rumen bugs. Protein and mineral content is low and this has to be allowed for.

Maize needs free draining soils and adequate heat units to cob well. Crops grown in poor conditions can produce good dry matter yields, but the grain fraction and therefore energy content will be poor.

Wholecrop cereals

This can generally be grown on sites not suitable for maize. Feed value is very similar to maize silage: high in starch and sugar, and low in protein and minerals. Grain to straw ratio will determine the energy content of the silage. In most situations this means that wheat would be the best bet. Barley, triticale, and oats can also be harvested.

Harvest date is critical, as the grains can go from too soft to too hard within a few days. Conventional corn crackers will not adequately crack the grain, which can then pass through the animal undigested. Some specialist contractors use a grain mill and header on the forager.

Clamp management is critical as the crop is so dry and hard to compact.

Lucerne

Lucerne is most suited in dry conditions. Lucerne is an excellent forage, high in protein and minerals. It is a very deep rooter and needs free draining soil.

Management is tricky. It is more difficult to establish than grass and cereals and in hot conditions may need cutting every three to four weeks.

The crop has to be rested before the winter so that it can build up reserves in its underground root system. Failure to do this, and wet soil conditions over-winter, can greatly reduce the persistency of the crop.

Pea silage

Specialist crops may not suit the all grass farmer. However arable farmers can use peas as a break from cereals in a rotation.

Variety choice is important. It is essential that the peas do not go down as they mature, otherwise a lot of soil can be brought in at harvest time.

Peas may need a lot of fungicide sprays in certain years and an experienced crop walker is a good idea. As with cereals, the grain to stem ratio will govern the energy content of the silage.

Grass and grass silage

Well-managed grass and grass silage can make excellent feed for cows. Grass has the highest digestibility and therefore energy content of all of our forages. (See Table 1).

However, it is the most difficult to manage. Quality can vary from day to day although good management can reduce this variation. Intake is more of an issue. Cows eat grass very slowly, typically1 to 1.5kg of dry matter per hour, compared to 4 to 6 kg per hour for a trough fed diet. As intake is so critical to a high yielding cow, any factor that reduces intake can be a severe problem. Wet or hot conditions can cause cows to shelter, thus losing valuable eating time and intake.

A small amount of a well-balanced buffer feed can help stabilise intakes, add long fibre, boost energy and mineral levels, and reduce the excess protein in pasture. This can actually improve utilisation of the grass.

On average, grass silage is wet and has the lowest digestibility of all silages. Some farmers consistently make good grass silage, but with inclement weather and contractor queues, it is hard for many to choose the ideal harvest date.

Finally

Choose the forage that suits your farm and that can consistently produce high quality feed. Research has shown that a mixture of forages usually out-performs using a single forage.

Take advice and watch out for new developments. Try to make the best quality forage that you can, as this will reduce the amount of grain needed. Analyse your forages routinely to maintain a consistently balanced diet and help reduce wasted feed costs.
Finally, some exciting work that Agriking is doing shows that with very digestible diets, cows will actually reduce their intakes for a given level of milk because of improved digestion. This feed efficiency saves money by getting more out of every mouthful eaten.