What's in Grass?

The protein content of purchased rations and, increasingly so, the UFL of purchased rations can be rolled off the tongue of any farmer in the country. But knowledge about the nutritional attributes of grazed grass, which makes up 60-80% of the total dry matter intake of most ruminants, is less well known.

Grass can be divided into its water and dry matter content. As you can see below from Figure 1, 100 kg of grass will contain approximately 83 kg of water. But it's the dry matter that contains the key nutrients that the animal needs. The dry matter can be divided into cell wall and cell contents. The cell wall of grass is the fibre content. While, the cell contents include sugar, protein, fats, minerals and other compounds.

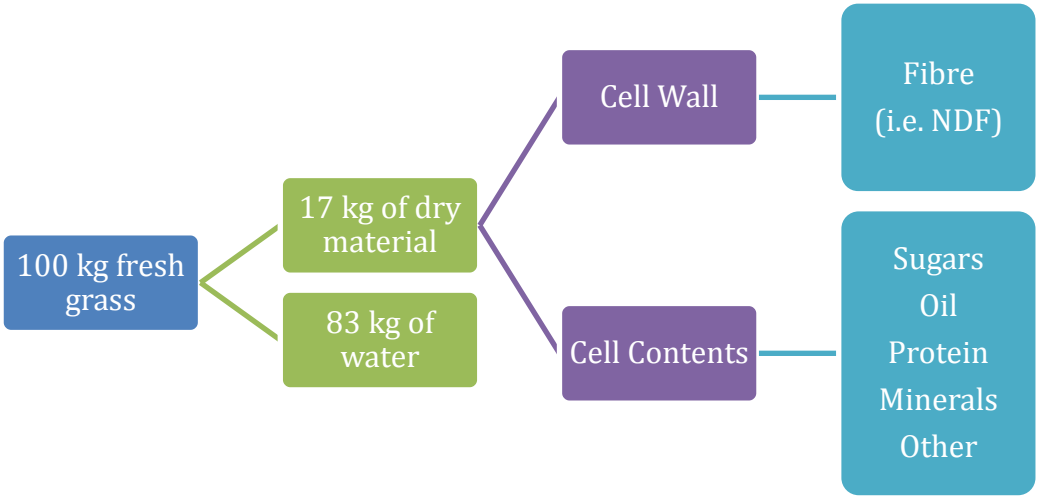


Figure 1. What's in Grass?

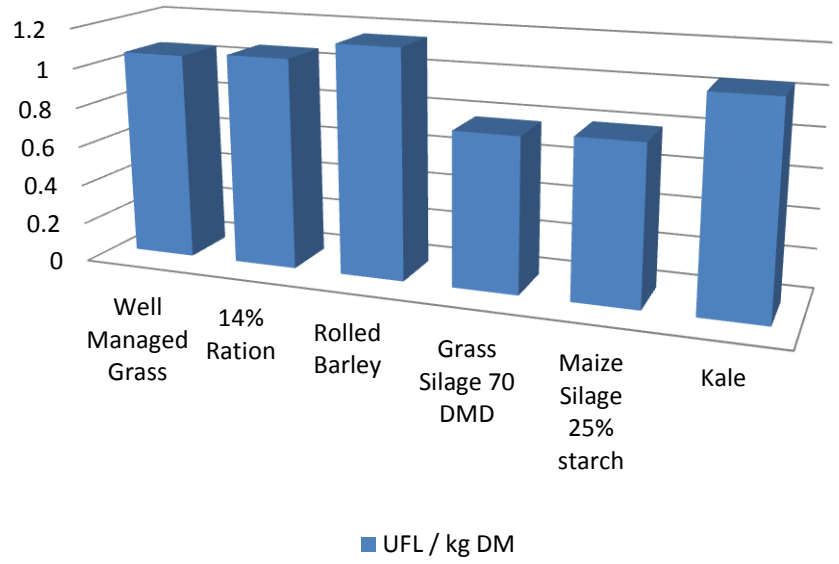
ENERGY

The energy in grass comes primarily from the sugar & fibre content, with some energy from oil & protein. The higher the proportion of leaf in grass (ideally over 80%) the higher the energy content coming from sugars and digestible fibre. Fibre is a key supplier of the energy in grass but it needs to be quality fibre. As the **proportion of stem in the grass plant the digestibility of the fibre decreases and consequently the energy content decreases. Therefore, grazing leafy grass is ideal for maximising performance.**

The energy content of grazed grass varies from 1.05 UFL / kg DM for leafy fresh spring grass to 0.85 UFL / kg DM for very stemmy grass in the Autumn. This compares well to other feeds (Figure 2). As farmers, grass energy content is controlled by maintaining swards with high perennial ryegrass content but equally important is good grassland management – grazing out of paddocks in Springtime, maintaining a 21 days rotation through the main grazing season, avoiding grazing heavy covers of grass and grazing to 4 cm.

The energy demands of the dairy cow can be met by a grass only diet throughout the main grazing season, with some supplementation needed at the shoulders of the year when grass supply is limiting. Likewise the energy demands of the suckler cow, calves, yearlings and finishing steers & heifers can be met by a grass only diet.

Figure 2. The Energy Content of Various Feeds



PROTEIN

The protein in any feed can be divided into the quantity and quality of the protein. The quantity of protein in grass varies typically from 16-28%, depending on the sward type, growth stage, fertiliser regime and time of the year. Occasionally, protein levels in grass dip as low as 11-12%. This can happen during a period of stress on the grass plant e.g. a drought. Quality of protein is defined by the PDI system. This system accounts for the quantity of protein that can be utilised by the animal i.e. not all protein in a feedstuff is utilisable by the animal.

So how much protein does the animal need? Protein is a key nutrient for appetite, milk production, reproduction and growth. Young, growing cattle and lactating cows need most protein. Young stock need 13-15% CP in the diet, lactating cows 14-17%, depending on yield and finishing cattle need 11-12% CP. Based on this information, its clear that the quantity of protein in grass is in excess of requirements. In fact, there is an energy cost to the animal excreting the excess protein in grass. Therefore, avoid feeding supplementary protein on grass. There is a cost in buying it, a cost in excreting the excess protein and an environmental cost.

Protein quality tends not to be an issue for young stock, suckler cows or finishing cattle on grass. But for freshly calved cows in Springtime, there is a need for some quality protein from ration for the first 6 weeks of lactation. And while Autumn grass has adequate protein for late lactation spring calving cows, freshly calved autumn calving cows need some quality protein in the ration to meet their requirements.

FIBRE

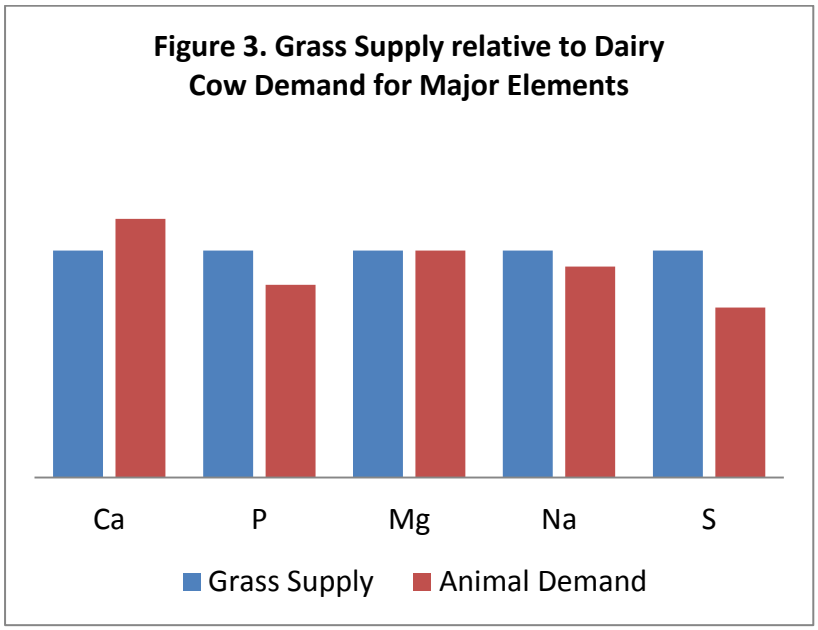
The rumen is the engine house of the ruminant animal, so maintaining a healthy rumen is key to good performance. Ruminants are unique in their ability to digest fibre from grass and other forages. And fibre is important in maintaining a healthy rumen. Cows have a specific requirement for fibre. When this are not met, rumen pH becomes unstable and animal performance suffers. Too little fibre is a problem but likewise too much fibre is a problem. Too

much fibre reduces dry matter intake, reduced energy intake, reduced body condition gain and production losses. Dairy cows need a minimum of 30% fibre (NDF) to maintain a healthy rumen. Beef cattle can thrive with much lower levels of fibre in the diet.

The fibre content of grass is defined by the neutral detergent fibre content (NDF %). The NDF content of grazed grass varies from 35% for leafy fresh spring grass to 50% for stemmy grass. So for the most part there is more than adequate fibre in grazed grass. Rumen pH (level of acidity) tends to be lower in grazing diets but research work from Northern Ireland, New Zealand and Australia indicate that feeding additional roughage has no impact on animal performance.

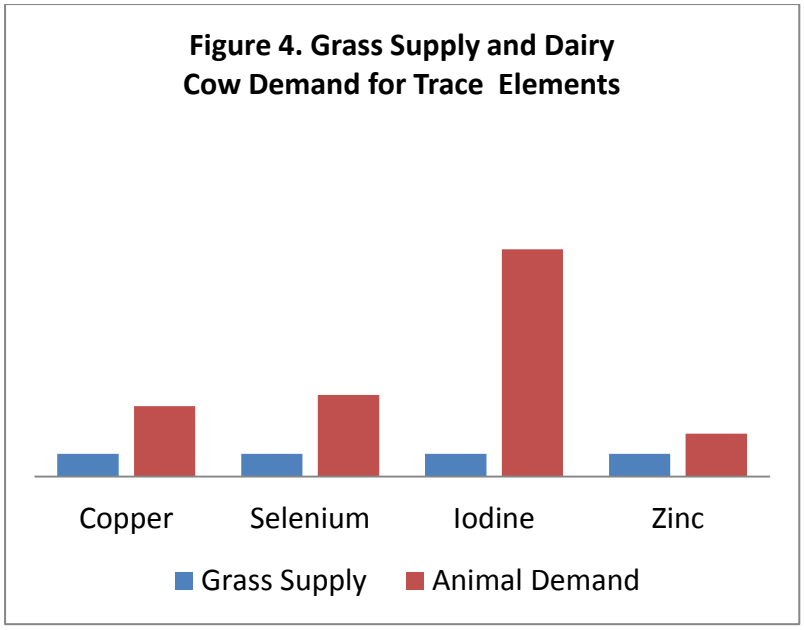
MINERALS

The mineral content of grazed grass can be divided into major elements (including calcium, phosphorus, magnesium, sodium and sulphur) and trace elements (including copper, selenium, iodine, cobalt, manganese and zinc). As is evident from Figure 3, major elements tend to be well supplied in grazed grass but deficiencies of major elements do occur e.g. magnesium during the tetany period or phosphorus on deficient soils.



Trace elements levels in grass are low (Figure 4) and consequently need to be supplemented at key periods during the year including pre-calving, post calving, during the tetany period and during the breeding season.

Take the guess work out of mineral supplementation and get your grass analysed every 3-4 years. This will establish the mineral status of the grass and the presence of any antagonists such as molybdenum and iron. While grass is deficient in trace elements, oversupplementing with trace elements is a problemon some farms and can cause more problems than it will solve i.e. toxicity.



COST

Grazed grass remains our cheapest feedstuff to produce at €80 / 1,000 units of energy (Figure 5). It is 2.5 times cheaper than grass silage and 3.5 times cheaper than a ration at €275 / tonne.