Nutrient content and *in sacco* digestibility of Grimmett barley grain and sprouts

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Products from hydroponic gardens have been used for both human and livestock feeding. Sprouting of grain has been reported to increase the activity of hydrolytic enzymes, improve the content of essential amino acids, total sugars and B–group vitamins and decrease concentrations of dry matter, starch and anti–nutrients. There are also claims of a 'grass juice factor' in green sprouted material that enhances livestock production (Randle *et al.* 1940). The aim of this initial study was to determine the changes in dry matter (DM) and energy, nitrogen and mineral concentration of Grimmett barley during sprouting, and assess the nutritive value of the grain and resulting sprouts for sheep.

A completely randomized design of two treatments (Grimmett barley grain and sprouts) and four replicates was used. Grains to be sprouted were pre–steeped in 0.1% *(v/v)* hypochlorite for 4 h before sprouting for 7 d in a temperature controlled room at 25°C using tap water and light. Samples of the grain and sprouts were freeze–dried and ground to 1 mm before analysis for DM and nutrient concentrations (AOAC 2000). The results of these analyses enabled the determination of a gain or loss of materials during sprouting. Four sheep (replicates), fitted with permanent rumen cannulae and fed lucerne and oaten chaff (20:80) *ad libitum*, had nylon bags containing cracked barley grain and fresh sprouts inserted into the rumen for 6, 12, 24, 48,72 and 96 h to determine the *in sacco* digestibility of these feedstuffs after oven–drying at 60°C for 48h.

There was a 21.9% loss of DM over the sprouting period (Figure 1). Gross energy was lower but crude protein and some mineral concentrations (except B, Mn and K) were higher in sprouts in comparison to the grain. There was no difference (P>0.05) in the digestibility values (12–96 h) for cracked barley or fresh sprouts (Figure 2). However, some DM uptake (possibly minerals from rumen fluids due to hypotonic nature of sprouts) occurred over the first 6 h.

A 21% loss in DM during sprouting without a significant improvement in DM digestibility *in sacco* represents a considerable reduction in total digestible energy. The higher crude protein and mineral concentrations in sprouts were largely accounted for by the loss in grain DM occurring during sprouting. These results indicate that the nutritive value of the original grain was higher than that of the resulting sprouts and so are not in favour of sprouting.

AOAC (2000). Official methods of analysis. Arlington, VI, USA.

Randle, S.B., Sober, H.A. and Kohler, G.C. (1940). The distribution of the 'grass juice factor' in plant and animal materials. *Journal of Nutrition* 20, 459–466.

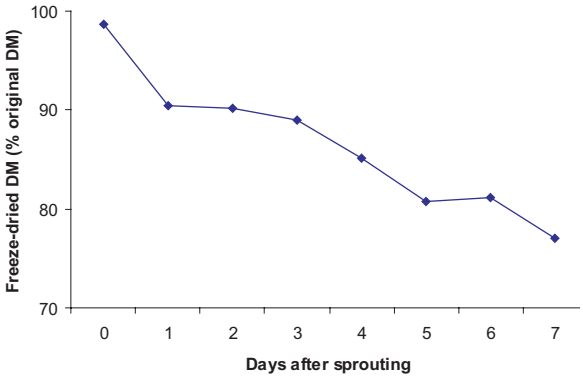

Figure 1 Dry matter loss from Grimmett barley during sprouting.

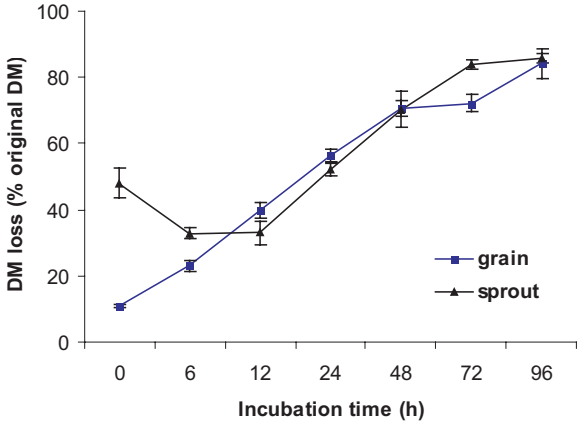

Figure 2 *In sacco* degradation of cracked Grimmett barley grain and fresh (7–day) sprouts.