Preservation and nutritive value of mixed silages of fodder beets and by-products

J.L. De Boever¹, E. Dupon², S. De Campeneere¹ and J. Latré²

¹ILVO, Animal Sciences Unit, Scheldeweg 68, 9090 Melle, Belgium, ²University College Ghent, Experimental Farm Bottelare, Diepestraat 1, 9820 Merelbeke, Belgium; johan.deboever@ilvo.vlaanderen.be

Due to the reform of the EU’s Common Agricultural Policy fodder beets (FB) are regaining importance on dairy farms as third crop besides grass and maize. FB are well-known as a productive and energy-rich feed, but they lost interest at the end of the 20th century because of the labour-intensive cultivation, harvesting and feeding, rhizoctonia disease and limited storability. Nowadays, resistant varieties and adapted harvest-machines open new perspectives and longer preservation is possible by ensiling FB mixed in whole plant maize. However, this combination is not ideal, because FB have to be harvested earlier than maize resulting in lower yield and dry matter (DM) content. Therefore, we studied the potential of mixing and ensiling FB with ready available by-products. Chopped FB with high DM content (22.0%) were mixed with either dry wheat gluten feed (DWG; 90.4% DM), dry maize gluten feed (DMG; 88.7% DM), dry chicory pulp (DCP; 89.2% DM), dried beet pulp (DBP; 89.5% DM) or pressed beet pulp (PBP; 25.1% DM) in a ratio of 50/50 on DM-basis. Each mixture was ensiled in two IBC containers (volume: 1 m³), one during 2 and the other during 12 months. The DM-losses and fermentation quality of the 5 mixed silages were determined. Chemical composition and digestibility of the silages as well as of the fresh FB were determined with sheep to derive net energy lactation (NEl), whereas the content of protein digestible in the intestines (DVE) was obtained with rumen-fistulated cows. In all silages fermentation continued during the whole storage period. After 1 year, DM-losses of the mixtures with DWG, DMG, DCP, DBP and PBP amounted to 26, 26, 10, 13 and 19%. The production of lactate, acetate and ethanol was high and their sum ranged from 138 for DBP to 244 g/kg DM for DMG, whereas NH₃-fraction was moderate (4.7 to 7.6%). The NEl of DWG, DMG, DCP, DPB and PBP amounted to 7.30, 7.25, 7.46, 7.26 and 7.39 MJ/kg DM respectively, which was slightly higher than for fresh FB (7.23 MJ/kg DM). The DVE of the mixed silages amounted to 72, 79, 87, 95 and 89 g/kg DM respectively as compared with 81 g/kg DM for FB.

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