Feeding of molassed sugar beet pulp instead of maize enhances net food production of high-producing Simmental cows without impairing metabolic health

Matthias Münnich, Fenja Klevenhusen, Qendrim Zebeli

Institute of Animal Nutrition and Functional Plant Compounds, Department for Farm Animals and Veterinary Public Health, University of Veterinary Medicine Vienna, 1210, Vienna, Austria

ARTICLE INFO

Keywords:
Sugar beet pulp
Net food production
Dairy cows
Energy metabolism
Sustainability of dairy production

ABSTRACT

Molassed sugar beet pulp (Bp) is a human inedible by-product of the sugar industry being a suitable dietary energy alternative to grains particularly in terms of increasing the net food production efficiency of high-producing dairy cattle. However, there are concerns that feeding large amounts of Bp can limit cow’s feed intake, jeopardizing both the production performance and metabolic health especially of high-producing dairy cows that have high energy needs. In the present study dietary inclusion of Bp as a substitute for maize grain was tested in a longitudinal block-randomized experimental design in early lactation high-yielding Simmental cows. The Bp inclusion rates were 0 g/kg (i.e., no Bp inclusion as control), 120 g/kg (12Bp), or 240 g/kg (24Bp) on a dry matter basis. The replacement of maize grain with Bp reduced the human edible input from 135.4 MJ GE/d in the control diet to 50.7 MJ GE/d in the 24Bp diet (P < 0.001). Feed and energy intake (P = 0.693), milk yield (P = 0.457) as well as energy corrected milk (P = 0.425) were maintained constant throughout the trial. As a result dietary inclusion of Bp turned a net food loss with feeding the control diet into a net food gain with dietary inclusion of 120 and 240 g/kg Bp (P < 0.001). The energy balance and blood metabolites were unaffected by the dietary treatments (P > 0.05), whereas dietary fibre digestibility was linearly improved (P = 0.038) with Bp feeding, indicating enhanced rumen health and functioning with Bp feeding. In conclusion, feeding molassed sugar beet pulp as partial substitution of maize until 240 g/kg is a viable alternative that can improve net food production without impairing the cows’ production performance and the metabolic health status of cows while improving the digestibility of fibre.