

Effect of Different Levels of Barley Grain on *In Vitro* Gas Production of Citrus Pulp Silage

A. A. Naserian, M. Kordi and R. Valizadeh

Department of Animal Science of Ferdowsi University of Mashhad, Mashhad, Iran

The aim of the present study was to evaluate the effect of different levels of barley grain on *in vitro* gas production parameters of citrus pulp silage. In this experiment, the whole citrus pulp was manually chopped (2-3 cm length) and used as untreated or treated with barley grain for 6, 12, and 18 g/kg fresh citrus pulp. Treatments were ensiled under anaerobic conditions for 6 weeks. Samples were taken, and dried and ground (to pass a 2 mm sieve). Rumen fluid was collected from three ruminally fistulated sheep (42 ± 2.5 kg, body weight) and strained through four layers of cheesecloth. The laboratory handling of rumen fluid was carried out under a continuous flow of CO₂. Into each syringe was weighed 200 mg of sample material (3 replicates per treatment sample). The syringe was then filled with 30ml of medium consisting of 10ml rumen fluid and 20 ml buffer solution. The syringes were placed in an incubator (38.6°C). Gas production was measured at 2, 4, 6, 8, 12, 24, 36, 48, 72, and 96 h. Cumulative gas production data were fitted to the exponential equation $P=b(1-e^{-ct})$, where b is the gas production from the insoluble fraction (ml), c is the gas production rate constant for b (ml/h), t is the incubation time (h), and P is the gas produced at time t. *In vitro* digestibility of organic matter (OMD %), net energy (NEL, MJ/kg), Metabolisable energy (ME), short chain fatty acids content, and flieg point of samples was estimated. The data were analyzed as a completely randomized design using the General Linear Model (GLM) procedure of SAS (2004). There were no significant differences between treatments for *in vitro* gas production parameters ($p>0.05$). The OMD, NEL, and ME were significantly different between treatments ($p<0.05$), so that by increasing the level of barley grain, %OMD, NEL, and ME of silages increased. There were no significant differences between treatments for SCFA content. Based on flieg point data, all treatments had very good quality. This data suggests that the addition of barley grain to citrus pulp silage will increase the energy content of citrus pulp silage without any adverse effects on treatments.

Key Words: Barley grain, Citrus pulp silage, Gas production