The effect of feeding diets containing intact or partially detoxified lupin on voluntary intake and milk production by Friesian dairy cows

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Abstract

The study determined the effects of partial removal of alkaloids (detoxification) ill crushed lupin seed (CLS) 011 voluntary food intake, and yield and composition of milk from dairy cattle. Twenty multiparous Friesian dairy cows (first 90 days of lactation) were assigned. according to a randomized complete-block design, to five diets. The diets were formulated to be isoniirogenous (25·6 g N per kg of diet dry matter (OM)) and contained napier grnss, lucerne hay, mai:e bran and urea. The control diet (CON) contained sunflower meal; two diets contained intact CLS at 150 (LUJ-15) or 300 g (LUJ-30) per kg diet OM. The other two diets contained detoxified CLS at 150 (LUD-15) or 300 g (LUD-30) per kg diet OM. Lupin seeds were detoxified by treatment with boiling water, followed by steeping in cold water. The diets were analused by gas chromatogrnphy for the alkaloids, lupanine and 13-hydroxylupanil1e. The total alkaloid content of LUJ-15 and LUJ-30 was 3·8 and 8·0 g/kg diet OM, respectively; by contrast that of LUD-15 and LUD-30 was 2·1 and 5·2 /k diet OM respectively. Tncreasing the level of intact CLS in the diet led to a decrease in voluntary food intake. ows ioen LUJ-30 had a ower /Ill II ay tall lOse give UJ- 9.xificatioll [up.' remove I'opertionatel1 abmtt 0'4 0 he total /ka/o-ids niake; """-L! ••••••• c.:;~ I ield milk and milk r tein P < ·05) but reduced mil fi conienn Detoxification of CLS also reduced the rumen degrndability of lupin protein (P < 0·05). it is concluded that the reduction in organic matter intake and milk yield of cows given diets containing intact CLS was due to the presence of lupanine and 13-hydroxylupanine. To maximize its usage in diets for dairy cattle, lupin should be detoxified; it can then be included at levels up to 300 g/kg diet OM.