EFFECT OF A HOP (*HUMULUS LUPULUS* L.) EXTRACT ON THE METHANE YIELD AND MILK PRODUCTION OF DAIRY COWS

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ABSTRACT

The addition of secondary plant metabolites in feed for lowering methane (CH_4) emissions from ruminants is widely investigated (1). Significant CH_4 reductions with *Humulus lupulus* L. (hop) were found *in vitro* (2). *In vivo* confirmation of these results, however, is still lacking. In this study the *in vivo* effectiveness of a hop extract to reduce methane emissions in dairy cattle was explored. Ten highly productive Holstein Friesian cows were involved in this trial, with eight cows being assigned as treated cows and two as control cows. In the pre-treatment period (PRE) of six weeks none of the ten cows received the extract. In the following treatment period (TRTM) of six weeks the treated cows received the hop extract (400mg/day) and the control cows did not. CH_4 emissions were measured in open-circuit chambers, at the end of both periods. Data were analyzed by using a linear mixed model with group (control and treated cows), period (PRE and TRTM) and their interaction as fixed effects and cow as random effect. No interaction effect of group and period was found for dry matter intake (DMI, $p=0.27$) as the control cows ate 19.9kg DM in PRE and 19.2kg DM in TRTM, and the treated cows ate 20.4kg DM in PRE and 19.9kg DM in TRTM. Also no interaction effect was found for absolute CH_4 emissions ($p=0.20$; control cows: 404g/day (PRE) and 408g/day (TRTM); treated cows: 442g/day (PRE) and 430g/day (TRTM)), nor for CH_4 expressed per kg DMI ($p=0.07$; control cows: 20.3g/kg DMI (PRE) and 21.3g/kg DMI (TRTM); treated cows: 21.6g/kg DMI (PRE and TRTM)). The treated cows, however, had a more persistent milk production ($p<0.05$) because they produced 26.4kg milk/day in both PRE and TRTM, whereas the control cows produced 29.2kg milk/day in PRE and 26.4kg milk/day in TRTM. Therefore hop was able to reduce CH_4 expressed per kg milk ($p<0.01$; control cows: 14.1g/kg milk (PRE) and 15.4g/kg milk (TRTM); treated cows: 17.4g/kg milk (PRE) and 16.6g/kg milk (TRTM)).

Keywords: GHG, CH_4, Dairy cattle, Mitigation strategy, Hop

References:
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