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Title	**Influence of chamomile flower and sweet basil by-products inclusion in sheep rations on *in vitro* rumen characteristics and their productive performance.**
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ABSTRACT

Two experiments were conducted to study the effect of replacement berseem hay (BH) and wheat straw (WS) by chamomile flower and sweet basil by-products on growing lambs performance. First experiment was carried out to determine the in vitro dry matter and organic matter disappearance to find out the best level of chamomile flower and sweet basil by-products (being 10, 20, 30 and 50% of DMI) to identify the best level for a subsequent in vivo digestibility and growth trails. Depending on the results of the first experiment, fifteen growing Ossimi cross breed lambs of 5 month old and 24 ±2.5 kg average live body weight were assigned into 3 similar feeding groups (5 lambs each) to feed one of the experimental rations. First group fed control ration consisted 50% roughage (20% BH +30% WS) plus 50% concentrate feed mixture (CFM), second group (CR50) consisted 50% Chamomile flower by-product plus 50% CFM, while third group (SB50) consisted 50% Sweet Basil by-product plus 50% CFM. Rations were formulated to cover maintenance and growth requirements of the lambs according to NRC, (1994).

Results of the first experiment indicated that the in vitro dry matter and organic matter disappearance (IVDMD and IVOMD), lambs fed of CR50 and SB50 rations were the highest ($P < 0.05$) value of IVDMD and IVOMD compared with control ration respectively. Second experiment in vivo showed non-significant differences between the three tested rations (control, CR50 and SB50) at different time 0, 3 and 6 hrs post feeding were noticed for pH value, NH3-N and TVF's concentrations in the rumen liquor. However significant ($P<0.05$) increase of apparent digestibility of DM, OM, CP and CF for lambs fed CR50 ration compared with those fed the control ration. The lambs fed CR50 and SB50 rations had higher ($p<0.05$) plasma protein and albumin values followed by those fed the control ration which recorded the lowest plasma protein and albumin values. In contrast, the lambs fed control ration had higher ($p<0.05$) plasma urea nitrogen than those fed CR50 and SB50 rations. The total body weight gain and average weight gain were higher ($p<0.05$) for lambs fed of CR50 and SB50 by about 20, 15.29% and 19.67, 14.75 % respectively compared to lambs fed of control ration. The lambs received ration replacement with chamomile flower by-product (CR50) grew faster than those received sweet basil by-product (SB50) and control rations. Lambs group fed CR50 ration recorded the highest ($p<0.05$) DM, TDN and DCP intake and as well feed efficiency ($p<0.05$) compared to SB50 and control rations .

In conclusion, herbal plant by-products (CR and CB), can partially replace berseem hay and wheat straw in growing lamps rations with useful performance and metabolic responses.