Application of agricultural and factory byproducts to growing poultry ration with 45 % replacement of imported feed

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OBJECTIVES

To encourage the environmental friendship of grain-based feeding system, the target should be directed not only to increase of forage utilization, but also to enhanced use of high energy and high protein by products. So far many studies have been conducted with swine, beef cattle and duck in Japan. (Ohmoto & Irie 1982, Nakanishi et al. 2003, Barroga et al. 2004). Presently focus was made on broiler ration.

INTRODUCTION

Agricultural and factory byproducts such as ungraded sweet potato and confectionary byproduct as energy source, and tofu cake, soy sauce cake and fish silage as protein source were examined. The feed which included byproduct ingredients more than 45 % on dry matter was prepared, ensiled and fed to broiler. Growth performance, edible meat and organ weight were investigated.

METHODS

Experiment 1. After mixing of byproducts and other ingredients, the byproduct feed, that is, eco-feed (Eco) was prepared and ensilaged more than a month. The 80% Eco feed (dry matter basis) was mixed with 20 % commercial broiler ration, and fed to animal. The target nutritive values were 17 % crude protein and 12MJ ME. Thirty chickens were divided into commercial feed (Ref) and Eco groups with 3 replicates of 5 birds per cage. After preliminary feeding of 3 weeks, growth performance was evaluated for 5 weeks and slaughtered at age of 56 day. Carcass sections and organs were weighed and relative weight of respective samples to body weight was calculated.

Experiment 2. The 2nd feeding experiment similar to experiment 1 was conducted where the difference from Exp. 1 was to use 53 % Eco-feed and to have 2 week preliminary feeding. Eco-feed was divided into two groups with respect to inclusion of fish silage (Eco1) or not (Eco 2) .

RESULTS

Experiment 1. Dry matter intake and daily weight gain for Eco group were 169 g/d and 76 g which were 14 % and 17 % larger than those of Ref group, respectively (Fig. 1 and 2). Feed conversion ratio for Eco group showed 13 % improvement compared to that of Ref group. The rate of edible tissue to carcass weight was 67 % with 1.6 % increase than that of Ref group (Fig. 3). The percentage of weight of digestive organs relative to body weight showed the higher tendency for Eco group, however, the reverse tendency was observed for the heart and liver (Fig. 4).

Experiment 2. In comparison with Exp. 1, dry matter intake and body weight growth tended to be lower for Eco-groups (Fig. 5 and 6). However the very similar tendency to Exp.1 was observed in the relative carcass section and organ weight to body weight (Fig. 7 and 8).

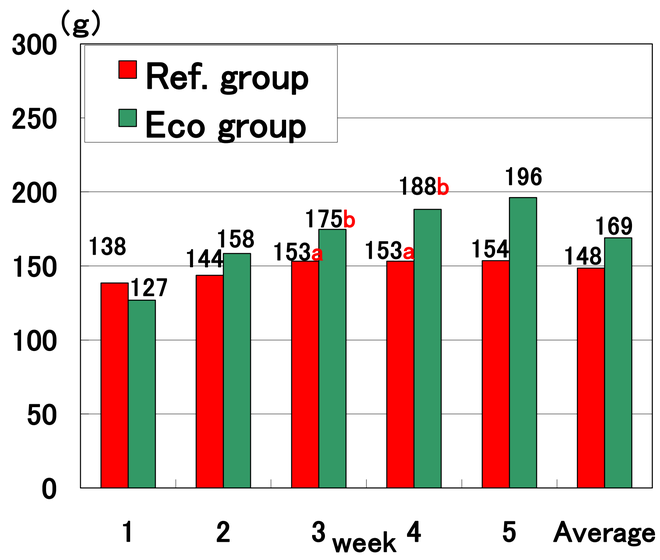

Fig 1. Weekly dry matter intake(g/d･head)(Exp. 1)

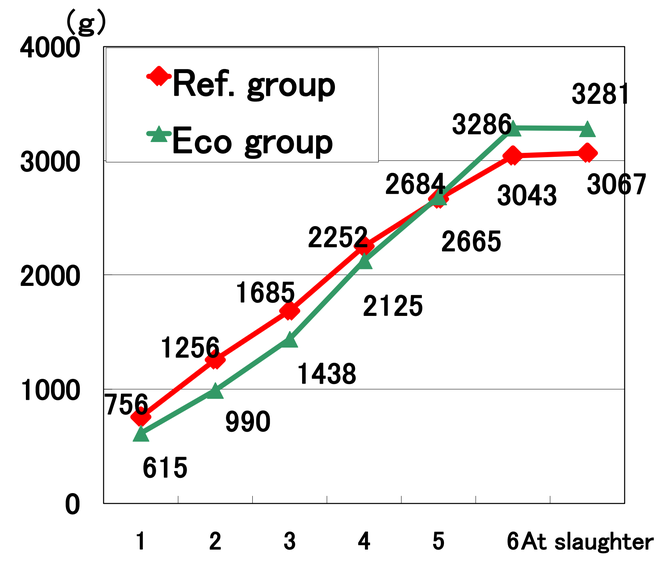

Fig 2. Weekly body weight change(g)(Exp.1)

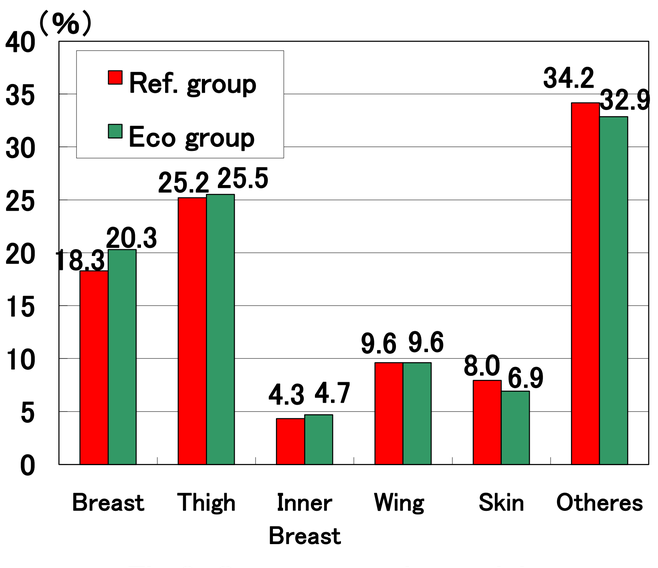

Fig 3. Carcass section weight relative to body weight (%) (Exp.1)

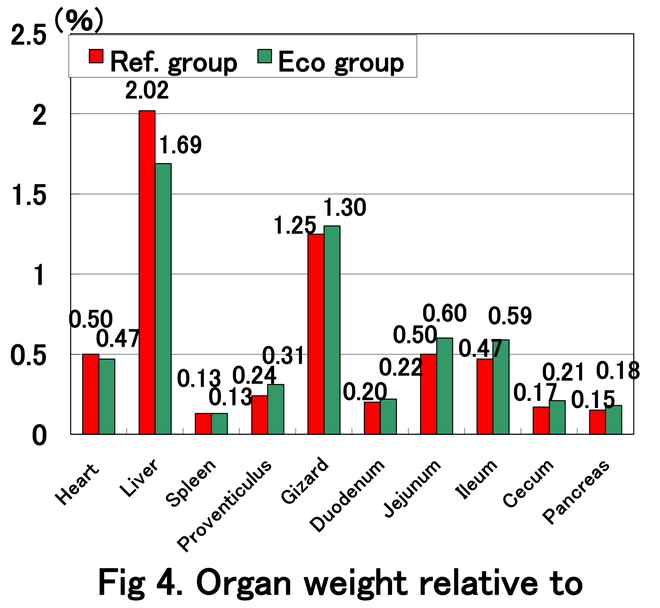

Fig 4. Organ weight relative to body weight (%) (Exp.1)

CONCLUSIONS

The eco-feed prepared with a half of ingredients from byproducts is applicable to broiler feeding without any adverse effects. The relative weight of gastro-intestinal tracts to body weight tended to increase for Eco group compared to Ref group.

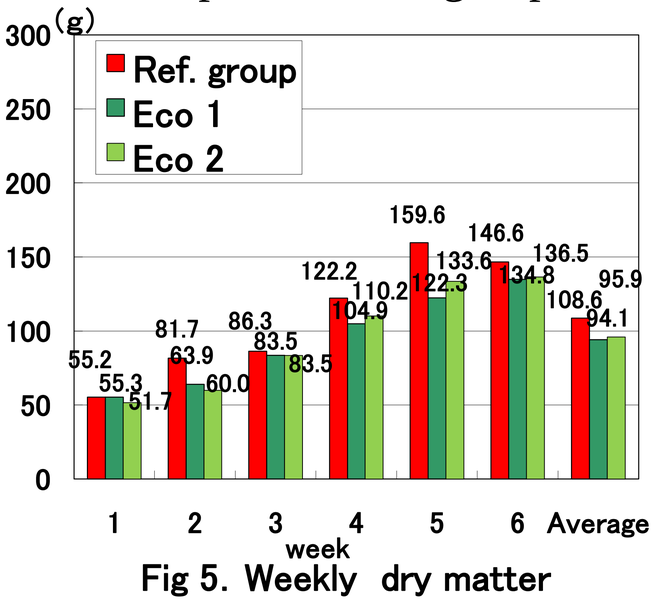

Fig 5. Weekly dry matter intake(g/d･head)(Exp. 2)

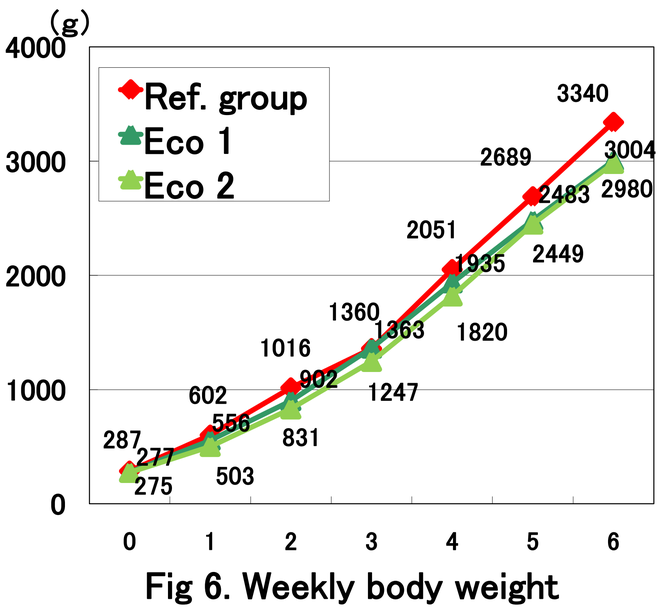

Fig 6. Weekly body weight change(g)(Exp.2)

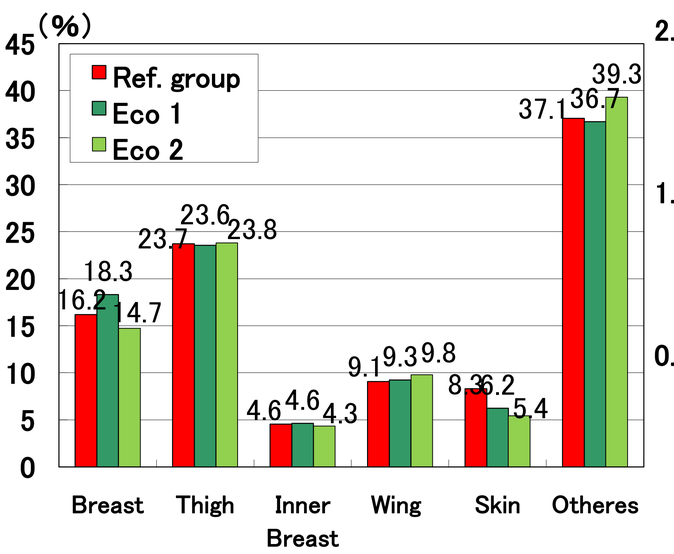

Fig 7. Carcass section weight relative to body weight (%) (Exp.2)

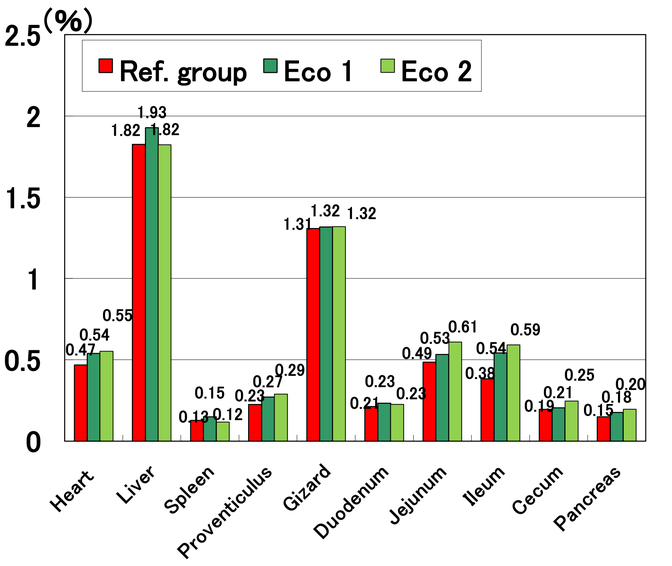

Fig 8. Organ weight relative to body weight (%) (Exp.2)