

Effect of *Plantago lanceolata* L. on the Growth and Meat Quality of Hinai-jidori Chicken

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INTRODUCTION

Plantago lanceolata L. (PL) contains bioactive compounds such as catalpol, aucubin (iridoid glycosides), and acetoside (phenylethanoid glycoside).

Effect of PL, a medicinal herb on the growth and meat quality of a Japanese brand chicken Hinai-jidori was investigated (Photo.1).



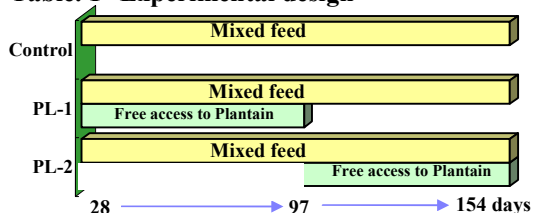
PL and Hinai-jidori chickens

Photo. 1

MATERIAL AND METHODS

Forty-five four-week-old Hinai-Jidori chickens were allocated to three dietary treatment groups: control, PL-1, and PL-2 for 127 days (Table 1). Chicken food intake, growth performance, blood metabolite levels, as well as quality and taste of the chicken meat were assessed.

Table. 1 Experimental design



RESULT AND DISCUSSION

There were no significant differences in the food intake and body weight among groups. The abdominal fatty rates and blood non-esterified fatty acids (NEFA) contents of both PL-1 and PL-2 groups tended to be lower than those of the control chickens; the NEFA content in the PL-1 group was lower than that in the control group ($p < 0.05$). The n-6/n-3 ratios of fatty acid in the thigh meat of PL-1 and PL-2 chickens tended to be lower than that of the control chickens. The peroxide values of the chicken meat showed a decreasing trend in the order of control > PL-1 > PL-2, and the differences between control and PL-2 was quite significant ($p < 0.05$) (Table.2).

These results indicate that the chickens fed with PL are healthier than those that were not fed with PL. Similarly, the meats of the chickens fed with PL are also healthier than those of not fed with PL. Moreover, PL feeding prolonged the shelf life of chicken meats.

Table. 2 Comparison of body weight, blood metabolites, and meat quality of Hinai-jidori chickens in the control, PL-1, and PL2 groups

| Item | Control | PL-1 | PL-2 |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Body weight | 2,542 ± 235 | 2,491 ± 178 | 2,554 ± 240 |
| Abdominal Fatty rate (%) | 4.3 ± 1.0 | 3.7 ± 0.4 | 2.5 ± 0.3 |
| NEFA (mEq/l) | 0.34 ± 0.20 ^a | 0.18 ± 0.02 ^b | 0.26 ± 0.11 |
| n-6/n-3 | 17.3 | 15.5 | 15.8 |
| Peroxide value (meq/kg) | 1.42 ± 0.42 ^a | 0.75 ± 0.07 | 0.25 ± 0.07 ^b |

Means within the same row with different superscripts are significantly different ($P < 0.05$).

Furthermore, the panelists of the paired preference test preferred the meats of the chickens fed with PL over those of chickens not fed with PL; in Scheffe's paired comparison test, the meat samples of chickens fed with PL scored higher than the meat samples of chickens that were not fed with PL (Fig. 1).

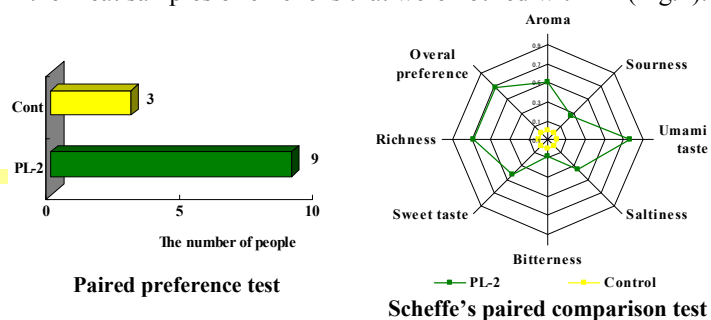


Fig.1 Paired preference test and Scheffe's paired comparison test for assessing the meat extracts from PL-2 and control groups

CONCLUSION

We conclude that *Plantago lanceolata* improves chicken's health and is extremely useful for producing healthy and a high-quality chicken meat.