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Technical and Economic Aspects on the Use of Herbal Medicine to Improve the Income of Broiler Poultry as Determining Success of Broiler Business

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Abstract. Herbal products that have been considered safe for the health of livestock and humans are formulated in the form of herbal medicine. This research was conducted to investigate the technical aspects of production which include feed consumption, body weight, feed conversion, and efficiency, as well as economic aspects consisting of acceptance and IOFC of broiler poultry business after being given a herbal herb Symsa. This research is an experimental research with completely randomized design (CRD) method which is carried out for 35 days (5 weeks), broilers used are 1 day old DOC (Day Old Chick) as many as 100 chickens which are grouped into four treatments, P 0, namely treatment without using herbs; P 1 treatment using 1% herbal; P 2 treatments using 2% herbs and P 3 treatments using 3% herbs from the total ration requirement. The findings were found that the administration of herbal medicine had an insignificant effect ($P > 0.05$) both the technical aspects of production and economic aspects. Although not statistically significant difference, economically the herbal treatment of 1 percent is considered the best decision by considering the benefits of herbal administration for broilers.

Keywords: technical aspects, economics, herbal medicine, broiler

INTRODUCTION

Efforts to develop poultry commodities aim to increase food security in a broad sense, which is also expected to be able to increase the purchasing power of the community through improving the income it receives, also being able to provide wider employment opportunities. Meanwhile, the competitiveness of downstream products or aquaculture products at the farmer level will continue to decline when expensive materials have been charged from the start, thus there needs to be an efficiency movement in the cultivation business,

given the price of imported chicken meat is still lower than the price of domestic chicken production, therefore the efficiency movement can be started from the price of feed raw materials, as well as feed prices [1].

The phenomenon that the current healthy lifestyle movement is sweeping the world, which has a back to the nature theme. This new trend has emerged, people want natural foods, low or even free of chemicals, pesticides, hormones, and chemical fertilizers. Organic food is considered to meet these requirements so that demand and marketing opportunities increase. It is explained that organic food is all types of food derived from living organisms both animals and plants [2]. Also, since the use of antibiotics as growth promoters have been banned by the European Union, herbs or products containing plant extracts are used as alternative feed supplements in animal production.

Garlic (*Allium sativum*), turmeric (*Curcuma longa*), and cinnamon (*Cinnamomum Verum*) have been widely used as medicines and as a growth promoter in animals [3]. Chemical-free livestock production systems have produced organic livestock products, including organic chicken meat and organic eggs. These products, among others, are produced with the application of herbal products whose basic ingredients are obtained from nature, and function as feed additives for livestock so that they form naturally supportive immunity in livestock. Herbal products that have been considered safe for the health of livestock and humans are formulated in the form of herbal medicine [4].

Various herbal ingredients derived from herbal plants found in Indonesia have the potential to be used as additional feed. Ingredients of medicinal plant ingredients are made according to their interests and functions which are selected from one type or several types of medicinal plants including ginger, turmeric, galangal, ginger, and others that are used to increase the appetite of poultry [3, 4]. The benefits of traditional herbs for the healing needs of chickens/poultry, are now beginning to experience significant advances. Among the

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Various herbal ingredients derived from herbal plants found in Indonesia have the potential to be used as additional feed. Ingredients of medicinal plant ingredients are made according to their interests and functions which are selected from one type or several types of medicinal plants including ginger, turmeric, galangal, ginger, and others that are used to increase the appetite of poultry [3, 4]. The benefits of traditional herbs for the healing needs of chickens/poultry, are now beginning to experience significant advances. Among the

effectiveness of the use of turmeric (*Curcuma xanthorrhiza* Roxb.) On the appearance of native chicken production which results are very significant [4]. The use of herbal solutions in ducks gave very significant results on feed consumption, body weight gain, carcass weight, and carcass percentage [3]. Similar studies have shown that feed consumption, feed conversion ratio, weight gain, and water intake are significantly affected by various herbal extracts containing saponins [5] as well as the use of Oregano (*Plectranthus amboinicus* L.) Leaf Meal [6].

Technically the use of herbs has been described previously, however, the aspects of success are not solely determined on the technical aspects, but also determined economic aspects. Assessing the successful use of herbs with IOFC parameters [7] and the use of income parameters for feed costs for herbal research on broiler chickens [8] as well as economic analyzes for duck breeds [9]. Based on previous research and information about the influence of herbs on broiler production is still inadequate because of the diversity of many findings, in addition, it is still necessary to combine technical and economic studies in realizing business success. Therefore, this research was conducted to investigate the technical aspects of production which include feed consumption, body weight, conversion, and feed efficiency, as well as the economic aspects consisting of acceptance and IOFC broiler business after being given a herbal concoction of Siyuna herbal production produced by the Livestock Laboratory of Muhammadiyah University of Malang.

METHOD

This research is an experimental research with a completely randomized design (CRD) method which was carried out for 35 days (5 weeks) at the close house of the Muhammadiyah University of Malang. The number of broilers used is one day old DOC (Day Old Chick) as many as 100 heads which are grouped in four treatments, P0 is treatment without using herbs; P 1 treatment using 1% herbal; P 2 treatments using 2% herbs and P 3 treatments using 3% herbs from the total ration requirement. Herbal treatment is given when the chicken is in the finisher phase (chickens aged 4 to 5 weeks), while in the starter phase (chickens aged 1 to 3 weeks) the feed used is the same ie without herbal treatment.

The herbs used are patent products of Siyuna brand, by the Livestock Laboratory of the University of Muhammadiyah Malang. Siyuna patent products with productive guard specifications are composed of several herbal ingredients, namely: ginger, garlic, betel leaf, turmeric, ginger, galangal, and cinnamon. The parameters set include the technical aspects of

production and economics. The technical aspects consist: Consumption, Body Weight Gain and Body Weight, Feed Conversion and Efficiency, while economic aspects include: Revenue, Feed Costs, and Income Over Feed Cost (IOFC). Feed consumption data is collected and recorded every day, while bodyweight is weighed weekly for 5 weeks. All data collected from various parameters were analyzed using analysis of variance (ANOVA).

RESULT & DISCUSSION

The results of the study for 5 weeks covering technical aspects of production: average ration consumption, final body weight, weight gain, and conversion and efficiency of broiler rations are presented in Table 1. Following.

Table 1. Average values of observation parameters for herbal on the technical performance of broilers production per tail.

Treatment	Consumption ^{ns} (gram)	Body Weight ^{ns} (gram)	Body Weight Gain ^{ns} (gram)	Feed Conversion	Feed Efficiency (%)
P 0	3,411.72	2139.65	2100.33	1.62	61.56
P 1	3,350.88	2140.80	2102.48	1.59	62.74
P 2	3,463.84	2194.80	2156.04	1.61	62.24
P 3	3,358.40	2071.05	2032.61	1.65	60.52
Average	3396.21	2136.58	2097.87	1.62	61.77

Source: processed research data (ns = no significant (P> 0.05))

Feed consumption

Analysis of variance showed that broilers receiving rations containing various levels of herbs had no significant effect (P> 0.05) on ration consumption. The average consumption of broiler rations in treatment P0 (1); P1 (2); P2 (3) and P3 (4), respectively 3411.72 gr, 3,350.88 gr, 3,463.84 gr and 3,358.40, with an average of 3396.21 gr. Which is graphically shown in Figure 1.

The results showed that increasing levels of herbal additions given had the same effect on feed consumption. The energy and protein content of feed that is in a balanced state in each treatment feed will produce identical feed consumption. As it is known that the energy protein balance is very influential on the amount of feed consumption so that the same protein-energy balance in the treatment feed will result in the same ration consumption [10]. Table 1. Also seen, the highest feed consumption in P2 treatment compared to other treatments. This is presumably due to the content of chemical compounds namely

essential oils which can increase feed consumption [4, 11, 12 and 13]. It is stated that every plant that contains active compounds such as essential oils, saponin, flavonoids, and tannins can increase the digestibility of substances food in the digestive tract so that the food substances consumed can be absorbed and utilized optimally for the formation of body tissues of production and reproduction. This causes an increase in the consumption of broiler chicken rations during maintenance.

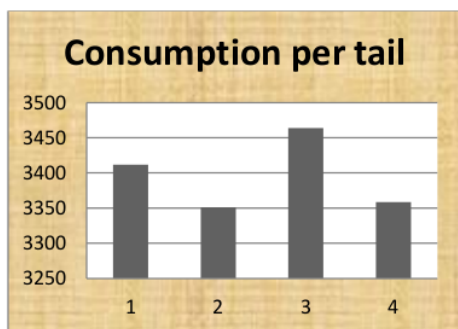


Figure 1. Average values of the observed consumption parameters of broiler per tail

Body Weight Gain and Body Weight

Table 1 with analysis of variance shows that the addition of various levels of *Siyuna* herbs has no significant effect ($P > 0.05$) on weight gain and final body weight. Bodyweight gain was calculated from the difference in final week body weight with initial bodyweight showing the average body weight gain for treatment broilers 2100.33 (P0), 2102.48 (P1), 2156.04 (P2), and 2032.61 (P3), and for final body weight. Along with the increase in body weight. Weight gain along with the consumption of rations, thus it can be stated that what affects the size of the broiler body weight gain is the consumption of feed and the fulfillment of broiler food needs.

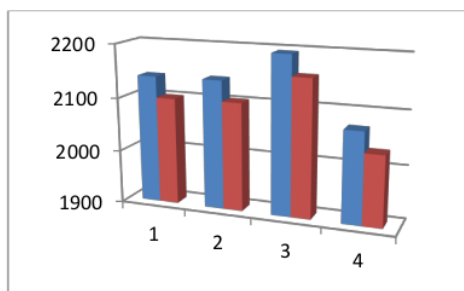


Figure 2. The average value of the parameters of bodyweight gain and body weight of the observation of broiler chicken herbal giving per tail (gram).

Figure 2. Shows that the highest weight gain in P2 treatment compared with P0. This is influenced by the amount of feed consumption, which means that high weight gain is influenced by the amount of feed consumed by broilers. Herbs that contain essential oils can help digestion by stimulating the nervous system of secretions so that gastric secretions containing enzymes such as pepsin, trypsin, lipase, and amylase are secreted into the stomach and intestine so as to increase the metabolism of nutrients, by increasing the consumption of herbs can increase chicken body weight [11], [12].

Feed Conversion and Efficiency

Feed conversion is a comparison between the amount of ration consumption and body weight gain in a certain time unit. can be seen in Table 1. The smaller the conversion value of the ration, the more efficient the animal is in converting feed into meat. The average value of ration conversion obtained from the calculation is 1, 62 while the minimum and maximum values are 1.59 and 1.65. Some of the main factors that affect feed conversion are genetic, feed quality, disease, temperature, enclosure sanitation, ventilation, treatment, and management of the cage. Factors of ration administration, lighting also play a role in influencing feed conversion, the rate of ration travel in the digestive tract, physical form of ration, and nutrient composition of ration [15]. Broiler feed conversion rates at five weeks according to Pond et al. (1995) ranged from 1.5-1.6. [16] thus the results of this study are in the normal range category. There is a difference in the conversion value of each treatment due to body weight gain and consumption that go hand in hand. Feed conversion is a comparison between feed consumption and the resulting weight gain. The smaller the value of feed conversion, the better because it shows that the use of feed is more efficient. The more efficient the chicken turns its food into meat, the better the conversion value will be [16].

Cost, Revenue and Income over Feed Cost (IOFC)

The cost of feed control rations is lower than the treatment ration and however, the feed costs are not significantly different from each other. The difference in ration price increases with the increasing number of herbs used in each treatment, this results in higher ration costs, as shown in Table 2. It is known that although the number of herbs used is relatively small at 1 percent, 2 percent and 3 percent, but the price of herbs is much higher than the price of other ingredients.

Table 2. Average values of observation parameters for herbal on economic aspects of broilers production per tail.

Treatment	Price of Feed (Rp/kg)	Cost of Feed (Rp / tail)	Revenue (Rp / tail)	IOFC ²⁵ (Rp / tail)
P 0	4188.55	14,290.14	34,234.40	19,944.26
P 1	4857.40	16,276.55	34,252.80	17,976.25
P 2	5438.38	18,837.69	35,116.80	16,279.11
P 3	6085.55	20,437.73	33,136.80	12,699.07

Determination of the amount of income over feed costs, including inputs that are calculated only the cost of the ration without identifying other inputs as well as the output which is calculated only receipts from the sale of broiler chickens. IOFC calculation results show that the treatment of P0 or without using herbal ingredients gives the highest value, this is because using herbal rations will increase in the cost of the ration and the smaller the IOFC value. When compared between herbal treatments, the highest IOFC value in P1 treatment or using herbs is 1 percent. This happens because the value of income over feed cost is influenced by ration consumption. When chickens get bigger the growth slows but the consumption of rations increases, so the conversion of rations will get bigger and longer and it results in declining income over feed costs [7, 17].

Although IOFC values differ statistically significantly, economically 1 percent herbal treatment is considered the best decision by considering the benefits of herbal administration functions for broilers, which is a food additive for livestock so that natural immune support is formed in animals. Herbal products that have been considered safe for the health of livestock and humans are formulated in the form of herbs [4].

CONCLUSION

Provision of herbal medicine has an insignificant effect ($P > 0.05$) on the technical aspects of production which include feed consumption, body weight, conversion, and feed efficiency.

The provision of herbal medicine has an insignificant effect ($P > 0.05$) on economic aspects consisting of revenue and IOFC of broiler farming. Although not statistically significant difference, economically the herbal treatment of 1 percent is considered the best decision by considering the benefits of herbal administration for broilers.

Further research is needed with the same material related to health parameters for broilers to obtain comprehensive and integrative conclusions

in supporting the success of the business and the fulfillment of livestock and human aspects of adversity.

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