



## The Effect of Bay Leaves (*Syzygium Polyanthum*) Administration Towards the Final Weight and Carcass Percentage of Laserpuncture-Induced Male Hybrid Ducks

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### Abstract

The carcass weight of laserpuncture-induced male hybrid ducks is not maximum yet. Nevertheless, it can be resolved by using bay leaves (*Syzygium polyanthum*) as a supplementary feeding to support the optimal work of laserpuncture technology. This research aims to evaluate the impact of bay leaves (*Syzygium polyanthum*) towards final weight and carcass percentage of laserpuncture-induced male hybrid ducks. This research applied Completely Randomized Design (CRD) with three treatments. Each treatment consisted of six replications, and each replicate consisted of six male hybrid ducks with homogenous age and weight. The three treatments were P0 (Control), P1 (Laserpuncture), and P2 (Laserpuncture and bay leaves). The data were analyzed by using Analysis of Variance (ANOVA) and continued by Least Significant Difference (LSD). The results suggested that the bay leave administration on laserpuncture-induced male hybrid ducks (P2) provided a significant effect ( $P < 0.05$ ) in comparison with (P0) & (P1) on the final weight. However, an insignificant effect ( $P > 0.05$ ) was identified on the carcass percentage of male hybrid ducks. The bay leaves administration on laserpuncture-induced male hybrid ducks can intensify the final weight gained, but it does not affect the carcass percentage.

**Keywords:** Hybrid Duck, Laserpuncture, Bay Leaves (*Syzygium Polyanthum*).

### Introduction

The increasing duck meat demand and the farmers' limited capability to meet the demand in the market have to lead a potential opportunity for duck farming business. This potential business opportunity should be balanced with modern technology utilization to intensify livestock productivity. Laserpuncture is a therapeutic method by applying laser as a stimulation source at the acupuncture points. This technology aims to provide stimulation through acupuncture points which cause the related organs to be more active or optimal.

Hence, significant capacity and efficiency development are well achieved to develop an excellent aspect for the living being [1]. Laserpuncture is one of the efficient performable technologies as an effort to raise meat production due to its faster, more economical, and more optimal effects. In addition, laserpuncture technology can be applied to increase body weight and carcass percentage on livestock [2, 3].

The laser utilization to stimulate the acupuncture points only requires a few seconds for each point. This technology is relatively affordable as one instrument can be applied massively with low operational costs [3, 5]. The development of laserpuncture in the animal husbandry, especially poultry, is relatively significant by far. The laserpuncture inducement on the male Madurese ducks is capable of intensifying the duck's weight and male duck carcass weight. However, the carcass weight obtained was not maximal, reaching only 452 g [6].

Therefore, it is necessary to provide a supplementary feed that supports laserpuncture technology to work optimally, namely by integrating natural plants into duck feed. One of the solutions is bay leaf (*Syzygium polyanthum*) treatment into the animal feed. Bay leaf (*Syzygium polyanthum*), categorized in the *Myrtaceae* family, is one of the herbs that has been long known and developed widely in Indonesia. S.

*polyanthum* leaf extract contains a bioactive compound that can generally be used as therapy [7]. Bay leaf contains tannin, saponin, and fiber which are relatively influential in reducing the fat content in the animal body. The anti-bacterial essential oils contained on bay leaves can inhibit the growth of pathogenic bacteria in the digestive tract, causing an increase in food substances absorption in the animal body. Finally, it will result in a better meat formation process [8]. This component can be utilized to inhibit the fat accumulation in the livestock's body to improve carcass quality and to reduce duck carcass fat [9].

Laserpuncture inducement, combined with bay leaves as a supplementary feed, is an effort to provide a solution towards hybrid ducks' final weight gain and carcass percentage. In addition, this study applied natural products in the form of bay leaves (*Syzygium Polyanthum*), which are widely available in Indonesia; thus, it can be applied as a good and nutritious supplementary feed for livestock to help meet the domestic market demand in providing good quality duck meat products. Therefore, the objective of this study was to determine the impact of bay leaves (*Syzygium Polyanthum*) treatment towards the final weight and carcass percentage of laserpuncture-induced hybrid male ducks.

## Material and Methods

### Research Preparation

The research was conducted for eight weeks, starting on November 27 to January 27, 2015, at the experimental animal cage, Faculty of Veterinary Medicine, Universitas Airlangga, Surabaya, Indonesia. The employed male hybrid ducks in this research were obtained from the people's farm in Sidoarjo, Indonesia. Three days prior to initializing DODs (Day Old Ducks), the cage was disinfected by using disinfectant. The newly arrived DODs were then provided sugar water to replace body fluids and to energize them.

Then, the DODs were quarantined for one week to adapt to the environment. A Newcastle Disease or ND vaccine was administered by giving drops in the eye mucosa or nostrils on the 14-day-old ducks. Furthermore, a Gumboro Disease vaccine was administered by mixing it into the drinking water of the 14-day-old ducks.

Meanwhile, the ducklings were preserved for two weeks in broodstock cages with the animal feed and drinking water provided *ad libitum*.

### Experimental Protocol

There were three treatments administered in this research. In each treatment, six replications were required [10]. Thus, there were 18 ducks employed in this research. Two-week-old ducks amounting to 18 duck samples of 100 ducks population were selected and categorized into three treatments, namely:

P0: The control group, carried out with neither laserpuncture-inducement nor bay leaf powder administration.

P1: The treatment group, administered with laserpuncture-inducement for 20 seconds.

P2: The treatment group, administered with laserpuncture-inducement for 20 seconds and 5% bay leaf powder consumption.

Then, all the groups were caged into a battery cage respectively to preserve intensive maintenance to the DODs. The treatment group was induced with 20-second laserpuncture and 5% bay leaf powder as supplementary feed. The laserpuncture inducement was performed weekly for eight weeks. Meanwhile, the bay leaf powder was administered every day after the ducks reached 45-60 days old [11].

On the 61st day, the process of butchering and weighing carcass weight was carried out. The animal feed and drink was carried out *ad libitum* and controlled every morning, afternoon and evening. The animal feed provided was BR 1 commercial animal feed, obtained from PT. Charoen Pokphand for the starter-phase ducks, and self-composed rations for the finisher-phase ducks. The feeding process was carried out twice a day, at 07.00 a.m. and 05.00 p.m. Before the feeding process, the feed was mixed with a little water and then well-stirred until it was completely mixed.

### Bay Leaf Powder (*Syzygium polyanthum*) Production

Bay leaves were cut with a size of 2-3 cm, then sun-dried for four days, eight hours a day. After that, the dried leaves were finely ground until they become powder. This stage was carried out in the Faculty of Pharmacy

Laboratory, Universitas Airlangga, Indonesia.

### Laserpuncture Inducement Procedures

Laserpuncture was induced at the growth points, namely the digestion point of Hu Men Point (ST 4), the heart point and lung point of Bei Ji Points (HT 1, BL 13, and BL 15), and the growth hormone point of Gou Hou Point (BL 64). Each inducement was carried out on the dexter and sinister sides and one on the immune system point of Wei Gen Point (GV 2). Anatomically, the locations of the four points are as follows:

- Hu Men Point (ST 4), located in the beak angle, next to the caudoventral corner of the mouth.
- Bei Ji points (HT 1, BL 13, and BL 15), located in the axillaries.
- Point Gou Hou (BL 64), located in the posterior side of the volar region on the tarsometatarsal joints.
- Wei Gen Point (GV 2), located in the dorsal part of sacrococcygeal, near the Bursa of Fabricius.

After discovering the point locations correctly, an inducement was performed with a 0.2 J laser beam for 20 seconds. The treatment was carried out on all samples in P1 and P2 which started in the first week after being relocated to the individual cages.

Then, the treatment was replicated over the following week on the same day until the eighth week. After that, the carcass was weighed, and the results were recorded. Finally, the researchers compared the weight of pre-butchered ducks and their carcass.

### Statistical Analysis

The statistical data were analyzed by utilizing one-way ANOVA. The calculated F-value obtained from this analysis was then compared with the F-table. From this comparison, it could be concluded whether there was an effect on the treatment administered (10). Should the result be significantly different, it will be proceeded with (LSD) Least Significant difference test.

### Results

#### Ducks' Final Weight

The cumulative results of the ducks' final weight carried out for eight weeks (60 days) after a statistical analysis administration illustrates that the control group, the laserpuncture-induced treatment group, and the laserpuncture-induced with bay leaves supplementary feed group indicated significant different results ( $p < 0.05$ ). The average result of the hybrid duck final weight can be seen in Table 1.

**Table 1: The average final weight of hybrid ducks in grams with 8-week-treatment (60-day-old ducks)**

Treatment	Final weight (g)
Control (P0)	642.1 <sup>a</sup> ± 68.709
Laserpuncture (P1)	730.0 <sup>b</sup> ± 45.290
Laserpuncture + Bay leaves (P2)	860.5 <sup>c</sup> ± 60.592

Note: Numbers followed by different letters in the same column indicate significant different result ( $P < 0.05$ )

The controlled group (P0) indicated the final weight of 642.1<sup>a</sup> ± 68.709. The laserpuncture-induced group (P1) signified the final weight of 730.0<sup>b</sup> ± 45.290. Meanwhile, the laserpuncture and bay-leaf treated group (P2) indicated a relatively significant final weight increase, amounting to 860.5<sup>c</sup> ± 60.592. These results demonstrated that laserpuncture inducement with bay-leaf administration as supplementary feed could increase the weight of male hybrid ducks.

#### Carcass Weight Percentage

The cumulative result of the ducks' carcass weight carried out for eight weeks (60 days)

after a statistical analysis indicates that the results between the control group and the laserpuncture-treated group was not significantly different,  $p$  (sig.) = 0.964 ( $p > 0.05$ ). In addition, the control group and the laserpuncture with bay-leaf treated group also indicated an insignificant difference in the results with  $p$  (sig.) = 0.468 ( $P > 0.05$ ).

Furthermore, the laserpuncture-treated and laserpuncture with bay leaf treated groups also indicated an insignificant difference in the result,  $p$  (sig.) = 0.496 ( $P > 0.05$ ). The average results of the hybrid ducks' carcass weight percentage can be seen in Table 2.

**Table 2: The average carcass weight percentage of hybrid duck in grams with 8-week-treatment (60-day-old ducks)**

Treatment	Final Weight (g)
Control (P0)	48.21 <sup>a</sup> ± 6.559
Laserpuncture (P1)	48.32 <sup>a</sup> ± 2.260
Laserpuncture + Bay leaves (P2)	49.99 <sup>a</sup> ± 1.787

Note: Numbers followed by different letters in the same column indicate significantly different result (P<0.05).

The control group (P0) indicated the final weight of 48.21<sup>a</sup> ± 6.559. The laserpuncture-treated group (P1) identified the final weight of 48.32<sup>a</sup> ± 2.260. Meanwhile, the laserpuncture with bay-leaf treated group (P2) indicated the final weight of 49.99<sup>a</sup> ± 1.787. These results suggested that the laserpuncture inducement with bay leaves treatment did not significantly affect the carcass weight percentage of hybrid ducks.

## Discussion

### Final Weight of Hybrid Ducks

The statistical tests result on final weight identified significant differences (P<0.05) between the control group (P0), the laserpuncture-induced group (P1), and the laserpuncture with bay leaf treatment group (P2). This fact occurred since the laserpuncture inducement at the growth points of hybrid ducks, namely the Hu Men (ST-4), Bei Ji (HT-1, BL-13, BL-15), Wei Gen (GV-2) and Gou Hou (BL -64) points were related to the heart, stomach, and lungs; thus influencing the final weight of hybrid ducks.

This finding was strengthened by research [12], stating that the initial stimulation phase of acupuncture points can change the current and ions in the area. Allegedly, the cells contained in the acupuncture points have sensitivity towards the stimulation, causing molecular (chemical) communication and propagating through the cellular system to the target organs.

The molecular information can enter cells and affect the proteins synthesis of cells to form an enzyme or substrate that can increase the efficiency and productivity of body or organs tissues. Finally, it affects the increasing growth rate. Weight gain was strongly influenced by the body's ability to supply oxygen for metabolic processes [13].

Thus, the stimulation at the Bei Ji points (HT-1, BL-13, BL-15) was significantly influential in increasing body weight because the Bei Ji points (HT-1), BL-13, BL-15) was capable of improving lung performance in providing oxygen and increasing cardiac

output [12]. Another cause for the final weight gain of hybrid ducks, in addition to the laserpuncture inducement, was the bay leaf supplementary feed.

The reason is because bay leaves contain 74.965g of carbohydrates, 8.362g of fat, 7.613g of protein and 5.436g of water in addition to high antioxidants, namely essential oil, flavonoid, saponin, and tannin. Therefore, the addition of bay leaf powder to the animal feed consisting of fish powder, soy pulp, and fine bran could improve the final weight of the hybrid duck.

The essential oil substance positively promotes the digestive enzymes activities such as amylase, lipase, and trypsin [14]. Bay leaves (*Syzygium polyanthum*) contain essential oils which inhibit the growth of pathogenic bacteria in the digestive tract which leads to better nutrition absorption in the animal body [8].

### Carcass Percentage of Hybrid Ducks

The statistic test results on the carcass percentage of hybrid ducks in this research indicated insignificant difference (P>0.05) between the control treatment (P0), laserpuncture-induced group (P1) and laserpuncture + bay leaf group (P2). The low carcass percentage of hybrid duck with laserpuncture inducement was due to the less precise laser-induced at the acupuncture points. The acupuncture points were employed to diagnose [15], to improve nerves [16], and to provide a more significant effect on the afferent neurons [17].

In addition, acupuncture point stimulation will also be more effective by using acupuncture lasers rather than the traditional acupuncture [18]. Genes and environmental factors can affect duck's growth rates, body composition, and production [19, 20]. Environmental factors can be divided into two categories, namely physiological and nutritional factors. The surrounding environment, preservation, and cage management can affect the carcass percentage [21].

Generally, ducks are kept in confinement and herds in Indonesia. In fact, the physiological and nutritional factors of ducks in confinement breeding system are much considered by farmers to always be in good condition since all ducks' needs are provided by farmers. Should these three aspects be in good condition, the carcass component formation will not be spoiled.

Meanwhile, in the herd breeding system, the shepherd ducks move freely by following where the rice is harvested. Thus the ducks are less cared for. On the agriculture location, ducks are given feed in the form of agricultural waste, containing lots of crude fiber. Meanwhile, on the fisheries location, the ducks are given feed in the form of fisheries waste, containing lots of protein. The difference in preservation systems and locations affects the ducks' productivity [22].

In addition to environmental factors, genetic factors are significantly influential in carcass quality and percentage. Genetic approaches such as poor genetic crossing methods can affect the duck's carcass quality [23]. Other

causes of the lack in carcass percentage of male hybrid duck, aside from genetic and environmental factors, were the crude fiber contained in bay leaves which also affects the carcass weight percentage. The high crude fiber content in bay leaves in the form of bay leaf powder supplementary feed with a high percentage of up to 5% affected the low carcass percentage values and meat tenderness [24]. This problem was suspected to occur due to the imbalance content between crude fiber and protein in the feed.

## Conclusions

Based on the research result, it can be concluded that the administration of bay leaves in laserpuncture-induced male hybrid ducks could increase the final weight gain of male hybrid ducks. Nevertheless, it could not increase the carcass percentage of male hybrid duck.

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