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FOREWORD

Agriculture as one of leading economic sectors in some countries, is currently facing many problems. This situation could be overcomed by policy and institutional environment which is condusive to increase agricultural productivity while maintaining a sustainable agriculture development and food security. According to this, it is required to develop strategies, a new paradigm, and holistic approach to support the agricultural growth continuum.

In order to make a significant contribution to the better understanding of sustainable agriculture for meeting food security needs and addressing climate change challenges, an International Conference on Sustainable Agriculture and Food Security was held in Bandung Indonesia on 27-28 September 2011. This conference was organized by collaboration of four faculties in Universitas Padjadjaran: Faculty of Agriculture, Faculty of Animal Husbandry, Faculty of Fishery and Marine Science, and Faculty of Agricultural Industrial Technology. Ministry of Agriculture of Republic Indonesia and internationally well-known experts from USA, Finlandia, Singapore, Germany, Malaysia, Romania, Republic of Serbia, China as well as Indonesia were invited as resource speakers.

More than 250 participants from 15 countries attended the conference. The conference shared experiences and views regarding agricultural production in a changing environment towards sustainable agriculture development to maintain food security, and stimulated cooperative research among participating institutions.

About 180 papers are presented and the committee hopes that these papers will be a lsating record of the contributions to this conference and a useful reference for all practitioners in the fields of agriculture in general. Some of the topics presented include critical issues dealing with sustainable agriculture and food security, agrosocio-economy, agritechnology, plant sciences, animal production, and food technology. The committee would like to thank the many reviewers of the papers for their contribution to these proceedings.

The conference and proceeding would have not been accomplished without the support of many individuals, groups and academic units. We owe our gratitude to those who commit and dedicate their self to this conference.

Benny Joy
Chair of ICSAFS

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ORAL PRESENTER

The Effect of Kombucha Supplementation in The Ration on Quails Body Weight and Dressed Carcass Weight

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Abstract

Hundred quails were used in this experiment to study the effects of Kombucha supplementation in the ration on quails body weight and dressed carcass weight, were studied for five weeks. This research used a Completely Randomized Design (CRD) with six treatments of Kombucha tea (0, 10, 15, 20, 25 and 30%), repeated four times. The ration treatments were: P-0 basal diet as control, P-1 basal diet + 10% kombucha; P-2 basal diet + 15% kombucha; P-3 basal diet + 20% kombucha; P-4 basal diet + 25% kombucha; and P-5 basal diet + 30% kombucha. Results indicated that the highest body weight (163.1 g) was get from the quails that fed basal diet + 25% kombucha (P-4) and the quails that fed only basal diet (P-0) has the lowest body weight (146.475 g). For dressed carcass, quails that fed basal diet + 30% kombucha (P-5) has the lowest carcass weight (116.85 g), and the highest carcass weight (141.125 g) are the quails that fed basal diet + 10% kombucha.

Keywords: body weight, dressed carcass, kombucha, quails, supplementation

Introduction

Quail is a collective name for several genera of mid-sized birds in the pheasant family Phasianidae, or in the family Odontophoridae. The quails are small, plump terrestrial birds. They are seed eaters, but will also take insects and similar small prey. They nest on the ground. They are capable of short, rapid bursts of flight. Some species, including the Japanese and Common Quail, are migratory and fly for long distances. Some quail are farmed in large numbers. These include Japanese Quail, also commonly known as coturnix quail, which are mostly kept to produce eggs that are sold worldwide. Japanese Quail (*Coturnix coturnix japonica)* endemic to East Asia, abundant across most of its range. They migrate to Manchuria, southeastern Siberia, and northern Japan, and winter in southern Japan, the Korean Peninsula, and southern China. Their preferred habitats are grasslands and cultivated fields. The plumage is a speckled yellow-brown, with a creamy white strip above the eye. Adults are approximately 20 centimeters in length. The quail is a small bird that inhabits woodland and forest areas around the world. There are thought to be more than 15 different species of quail, with each species of quail being found in different parts of the world and all have slightly different appearances depending on how they have adapted to their environment. Although the quail is very small sized bird, the quail belongs to the same bird family as pheasants. Quails range in size depending on the species from the Japanese quail which is around 10cm tall to the larger mountain quail that can grow up to 25 cm tall. Quails are generally solitary birds and spend most of their time either on their own or in a pair with just one other quail. During the mating season it is common to see large flocks of quails as family groups convoy together in groups of up to 100 quail individuals. Quails do not tend to migrate and therefore spend their lives within the same area. In some parts of the world, quails are kept as poultry birds both for the small amount of meat that they contain and for the quail's brightly coloured eggs. These tiny coloured

eggs are seen as a delicacy in some parts of the world and can often be found on menus in posh restaurants. When quails reach 2 months old, they are then able to mate. Quails tend to breed in more open areas such as farmland and lay their eggs in nests. Quail clutch sizes can vary between one and 12 eggs depending on the species of quail and the baby quail chicks hatch out of their eggs in less than a month.

Feeding Quails

In recent years quail have also been successfully reared by methods similar to those applied to chicks. Feed ingredients are similar, but the amounts are adjusted to meet the nutritive requirements of the species (Heuser, 2003). Feeding to add flesh at a rapid rate, must consider the amount of protein that is needed because without that the birds will not fatten up quickly (Batty, 2005). However, high protein food, usually special pellets or turkey crumbs; must be fed all the time on an ad lib basis. The adults eat layers pellets finch food, chick grit, mealworms and fresh greens. Rear them on either chick crumbs, which are 20- 22 percent protein, or turkey starter crumbs, which are 26-29 per cent protein. Nutrients requirements of Japanese quail (*Coturnix coturnix japonica)* for breeding, energy base 1.361 kcal ME/lb. The metabolic rate of birds will be affected by the type of diet (Ensminger, 1990). Put pebbles in the water dish so that the young quail, which resemble bumblebees. If the chicks are adult-reared the parents will brood them if the aviary is large it will make sense to confine the birds in part of the floor area until they fly at about three weeks of age, so that they don't become separated from their parents. At this age you can begin diluting their crumbs with cheaper and less nutritious food. If the chicks are hatched in an incubator you will need to offer them heat, such as a brooder or infrared light, for the first couple of weeks. Japanese quail mature in about 6 weeks and are usually in full egg production by 50 days of age. With proper care, hens should lay 200 eggs in their first year of lay. Life expectancy is only 2 to 2½ years.

Body Weight of Japanese Quails

If the birds have not been subjected to genetic selection for bodyweight, the adult male quail will weigh about 100–140 g, while the females are slightly heavier, from 120–160 g. They fatten readily with a high conversion rate for the food eaten (Batty, 2005). The Japanese quail is a fast growing hardy bird. They are mature at around 6 weeks of age and are laying eggs by around 7-8 weeks of age. Males are characterized by a rusty brown throat and breast feathers while the hens have a lighter cream colored feathering on the neck with black stripes and dotting on the breast. The primary reasons for keeping quails, are for meat, eggs and as pet (hobby). The meat taste very delicious. Quail is small birds with plump breasts and a mild flavour. The hen is plump and tender, and the cock is almost as good, with a spectacular green neck and long speckled tail feathers. While most other types of fowl require a farmyard setting with plenty of room, even city dwellers are able to raise these small birds if their zoning requirements permit.

Kombucha Supplementation

Kombucha is fermented tea that is often drunk for medical purposes. There are scientific studies that support the health benefits of Kombucha as antimicrobial (Sreeramulu, *et al*., 2000; Cetojevic-Simin *et al*, 2008). Kombucha contains multiple species of yeast and bacteria, as well as the organic acids, active enzymes, amino acids, and polyphenols produced by those microbes. Yeast ferments contained in kombucha tea are *Candida albicans, Saccharomyces sp.*, and *Pichia fermentans* while the bacteria are *Acetobacter*

xylinium, Gluconicum bacteria, and *Acetobacter ketogenum* (Williams, 2001). According to Akhadianto (2009), Kombucha fermented tea, has no negative effect, when supplemented in broiler ration. To carcass weight, it more 2% compared to the broiler with no kombucha fermented tea in the ration. Even there is no significancy on the liver, gizard and hearth, and the abdominal fat. Various compounds have been added to livestock and poultry diets to increase the efficiency of food utilization. Most of these additives do not supply nutrients although they effect food utilization in some species. Besides some organic acids, Kombucha tea fermentation, has vitamin B1, B2, B3, B6 and B12 which effective in metabolism process of some food ingredients (Frank, 1995).

Results And Discussions

1. The Effect of Kombucha Supplementation in Ration on Body Weight

In Table 1, presents the body weight of quails that fed with Kombucha supplemented ration.

Table 1. The body weight of quails that fed Kombucha supplementation in ration (g)

Replication	R-0	R-1	R-2	R-3	R-4	R-5
I	155.5	164.4	167.4	164.7	156.2	155.6
II	153.6	173.5	164.2	166.5	161.2	154.1
III	130.3	156.0	161.9	152.7	154.5	162.1
IV	146.5	158.5	148.0	159.5	162.9	163.1
Average	146.475	163.1	160.375	160.85	158.7	158.725

From Table 1, the average body weight ranged between 163.7 g – 146.475 g; and the quail that fed normal ration (R-0) that has not supplemented with Kombucha are the lightest (146.475 g). These results showed that the Kombucha supplemented groups improved the body weight than the control groups, that feed no Kombucha tea fermentation supplementation in the diet. It means that the beneficial effect of kombucha tea on ration. The improvement in the body weight in this study may be due to the increased efficiency of digestion and nutrient absorbtion processed due to precence of the kombucha tea. As a consequence, there is an improvement in the intestinal environment, increasing the efficiency of digestion and nutrient absorption processes. The adult male quail usually will weigh about 100–140 g, while the females are slightly heavier, weighing from 120–160 g. Combucha tea fermentation has useful medical effect to intestine and also anti-bacterial effect as asetic acid, glucoronic acid, gluconic acid, citric acid, oxalic acid, lactic acid and butiric acid (Williams, 2001). According to Akhadianto (2009), Kombucha fermented tea, has no negative effect, when supplemented in broiler ration. To carcass weight, it give more 2%; compared to the broiler with no kombucha fermented tea in the ration.

2. The Effect of Kombucha Supplementation in Ration on Dressed Carcass Weight

In Table 2, there is data of Dressed Carcass Weight of quails that fed Kombucha Supplementation in ration. From Table 2, the average dressed carcass of quails are between 116.85 g – 141.125 g, and the highest dressed carcass weight is the quail that fed with basal diet +10% kombucha (R-1); and the lightest dressed carcass weight is the quail that fed with basal diet +30% kombucha (R-5). The dressed carcass, are light because many fat in the abdominal and the fat in quail meat are smallest, and then they have smallest carcass

weight. Organ percentage in the quails that fed Kombucha supplementation, even there is no significancy, but has more abdominal fat (Akhadiarto, 2009). So, the dressed carcass weight more lighter, because some fat was thrown when dressing carcass.

Table 2. The Dressed Carcass weight of quails that fed Kombucha supplementation in ration (g)

Replication	R-0	R-1	R-2	R-3	R-4	R-5
I	144.1	146.4	155.9	133.6	135.6	128.0
II	134.7	144.1	135.3	123.3	110.5	118.3
III	125.4	149.8	131.9	129.1	109.5	105.9
IV	134.8	124.2	139.5	133.1	134.9	115.2
Average	134.75	141.125	140.65	129.775	122.625	116.85

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