

CHAPTER 1 INTRODUCTION

1.1. Research Background

Poultry is one of the livestock commodities that many people enjoy because it has a source of animal protein that is economically affordable compared to other livestock origin meat. In the field of poultry commodities contributed as much as 60.37% as a supplier of animal protein compared to beef which only 23.39% and meat from other livestock which only amounted to 16.24% (Bahri, 2006). Waterfowl is also one of the poultry that can supply quite large in meeting the needs of animal protein. Waterfowl in Indonesia very diverse, including Muscovy Duck and Mule Duck.

Muscovy Duck (*Cairina moschata*) is one of the type domestic fowls that has a considerable role as a good meat-producing poultry and is a commodity that has enough potential to be cultivated. Statistics from the Directorate General of Livestock and Animal Health (2019) noted that the production of waterfowl meat such as Ducks and Muscovy Ducks in 2019 amounted to 38,340 tons and 5,882 tons. Muscovy Duck is a waterfowl that is widely farmed by the community (Suryana *et al.*, 2014). Data obtained by Directorate General of Livestock and Animal Health (2019) shows that the population of Muscovy Duck in Indonesia in 2018 amounted to 9,024,146 tails, and the population in East Java Province reached 1,522,663 tails. The development of Muscovy Duck as a meat producer has an excellent increase, because it has a better growth rate and carcass weight compared to other types of ducks (Steklenev, 1990; Solomon *et al.* 2006).

Ducks are waterfowl that have a variety and types, ranging from wild waterfowl to farmed waterfowl. Various waterfowl there are waterfowl that have an important meaning for human life, because it is able to meet one of the human food needs (Tjuk, 2020). Local ducks (*Anas platyrhynchos*) belong to the kingdom animalia; phylum Chordata; Aves class; order anseriformes; family Anatidae; subfamily Anatinae; tribus Anatini; genus *Anas* and species *Anas platyrhynchos*. Ducks have great potential to be developed and useful as a source of community protein needs. Local Ducks have many advantages including being adaptable to the environment, having high resistance to disease and having great diversity. The great diversity of local Ducks opens up the possibility to obtain local Ducks with good production properties, which can be done with selection and cross efforts (Srigandono, 1998). Waterfowls in addition to Muscovy Duck that began to be popular lately is Mule Duck.

Mule Duck is a waterfowl that the result of a crossbreeding between male Muscovy Duck and female Duck. The cross between Muscovy Duck and Duck has occurred naturally in the community of Indonesia. The development of the duck enlargement business encourages breeders in developing hybrid strains that have many advantages over local strains in terms of speed and uniformity of growth (Tjuk, 2019). He'rault *et al.* (2008) said, crossbreeding between species will get offspring or *intercrossbred* that controls the heterosis effect of the combination of beneficial genes of both species. Noor (2008) said, livestock that did not have family relationships, if crossed then the offspring tend to display better performance than the average performance of their elders for certain traits.

The advantages of Mule Duck, among others, have rapid growth, large body weight, and productive in producing meat (Harahap 1993; Roesdiyanto and Purwantini 2001; Simanjuntak 2002; Setioko 2003; Suparyanto 2005), resistant to disease attacks and low mortality ranges from 2-5% (Anwar, 2005). Judging from the ability of meat production and lowfat content in Mule Duck, Mule Duck is a poultry that is potential enough to be developed as a productive meat producer with a short harvest period (Muharlieni, 2008).

The types of Muscovy Ducks and Ducks used in this study for crosses so that it can make Mule Duck are types of Muscovy Duck and Peking Ducks. Peking Ducks (*Anas platyrhynchos domestica*) is a waterfowl classified in broiler types, because they have rapid growth in a relatively short period of time (Agriflo, 2012). Peking Ducks belong to kingdom animalia, phylum chordata, class Aves, order Anseriformes and family Anatidae. Peking ducks are omnivorous (all eaters) that eat animals and plants such as grains, grasses, fish, snails and conch (Suharno and Setiawan, 1999). Ducks have a very fast growth ability because they are able to consume large amounts of rations (Wakhid, 2013). Tai and Rouvier (1998) recommends that Mule Duck should be obtained from a cross between male Muscovy Duck and female Peking Ducks, because in addition to the difference in body weight, also because the production of duck eggs is much higher than the hatch so that it can be obtained a large number of Mule Duck derivatives.

The use of male Muscovy Duck and male Mule Duck types compared to female Muscovy Duck and female Mule Duck in this study is because Indonesians people often use male Muscovy Ducks and male Mule Ducks to cut, because their

bodies are much larger than the female Muscovy Ducks and Mule Ducks, resulting in more meat. By knowing this, research on male Muscovy Ducks and male Mule Ducks is needed by the community as a reference to find the best waterfowl as a cut poultry. Female Muscovy Duck and female Mule Duck in the community, are rarely cut because it is a good hardener for watering chicken eggs and ducks (Wiwin, 2011).

One of the difference in characteristics of Muscovy Duck and Mule Duck can be known from the growth patterns of them. Each Muscovy Duck and Mule Duck have a different body size, although Muscovy Duck and Mule Duck are in the same age. Body size is a characteristic that reflects the fitness and health of the body shape so that it can be used in selection. To know the difference the body size among superior waterfowls such as Muscovy Duck and Mule Duck need to be done further research using poultry Muscovy Duck and Mule Duck that are still in the growth age (*grower*) so the difference in body weight between the two animals can be see clearly. Differences in body size between Muscovy Duck and Mule Duck can be observed from feed consumption, weight gain and feed conversion ratio. This is what led the authors to conduct a study looking for the differences in body weightof Muscovy Duck and Mule Duck, especially in male animals at the growth age with commercial feed. Research that related with this topic has been done before from Muharlien (2008) about Response to *starter* feed change to *finisher* on production performance in Mule Duckbut until now there has been no explanation regarding the difference of feed consumption, body weight and feed conversion ratio between male Muscovy Duck and male Mule

Duck at the growth age with commercial feed. Based on the background above, research was conducted on the difference of feed consumption, body weight and feed conversion ratio between male Muscovy Duck and male Mule Duck at the growth age with commercial feed.

1.2. Problem Statements

1. Is there a difference in feed consumption between male Muscovy Duck and male Mule Duck at the growth age with commercial feed in each day?
2. Is there a difference in body weight between male Muscovy Duck and male Mule Duck at the growth age with commercial feed in each week?
3. Is there a difference in feed conversion ratio between male Muscovy Duck and male Mule Duck at the growth age with commercial feed each week?

1.3. Outcome of Research

1. To obtain data comparing feed consumption in male Muscovy Duck and male Mule Duck at the growth age.
2. To obtain data comparing body weight growth in male Muscovy Duck and male Mule Duck at the growth age.
3. To obtain data comparing feed conversion ratio in male Muscovy Duck and male Mule Duck at the growth age.

1.4. Aim of Research

To gain data information about the results of measurements to the ratio of feed consumption, body weight and feed conversion ratio of male Muscovy Duck

and male Mule Duck at the growth age. As well as enriching research in the field of waterfowl, especially in Muscovy Duck and Mule Duck.

1.5. Theoretical Basis

The need for animal protein consumption can be fulfilled with poultry origin proteins, especially the type of waterfowl that feels less. Muscovy Duck has the potential as a good source of meat with low fat content compared to other ducklings, resistant to diseases that commonly attack poultry, relatively easy maintenance, has high adaptation power so that it can be maintained widely throughout Indonesia. Muscovy Duck is also resistant to various economic turmoil and has been tested to have its own competitive advantage based on its own (domestic) feed that is in the vicinity of such as corn, market waste (Wiwin, 2011). Another advantage of the Muscovy Duck is that it produces a higher weight of carcass and chest meat than Peking Ducks (Solomon *et al.*, 2006).

Duck is a potential egg and meat-producing poultry, so in its development is expected to be one of the alternatives to poultry commodities to meet the protein needs of animal origin (Rositawati *et al.*, 2005). Some of the superior properties contained in this duck include: rapid growth, large body size and have thick muscles / flesh, varied fur color (mix of white and black fur color), high carcass weight and clean white carcass color (Purba, 2014). Duck feed can be in the form of factory-made concentrates that are recommended until the age of 3-4 weeks, after which the feed can be replaced in the form of a mixture of concentrate feed with bran or other alternative feed (Sembawa, 2004).

Mule Duck has a lower fat content than other types of broilers duck (Sari 2002; Simanjuntak 2002; Setioko 2003; Suparyanto 2005). Judging from the ability of meat production and lowfat content in Mule Duck, Mule Duck is a poultry that is potential enough to be developed as a productive meat producer with a relatively short harvest period. Mule Duck also has several other advantages including being easy in its maintenance, and the meat is soft, savory and fishy, grows faster than ducks and is resistant to disease, the mortality rate is low, and can be harvested at 6-7 weeks of age with a body weight of 1.50 - 1.80 kg (Muharlieni, 2018). Mule Duck's feed can use pellets and agricultural bran with a ratio of 2:1 as well as with other alternative feed (Srigandono, 1997).

Growth is a weight gain resulting from the consumption of feed that has good quality nutrition. Growth and development of weight is an important thing in the maintenance of livestock to achieve optimal livestock weight as desired (Mirfat, 2011). Aberle *et al.* (2001) and Lawrie (2003), said that growth consists of two aspects, namely growth which includes time (age) and growth which includes changes in body mass as a result of the growth of differentiated body components. Factors that affect weight gain in poultry is, type of species, production type, sex, environmental temperature, season, quality and amount of food, maintenance management, feed form, feeding system, nation, body size and initial weight (Santoso, 2008). The purpity in using male waterfowl is to have faster growth compared to female waterfowl (Sri, 2013).

The growth rate of livestock can be observed in the *starter* and *grower* phases. Observations in both phases are made to find out at which phase there is

an inflection point. Lasley (1978) describes the point of the growth curve, as a meeting place for growth acceleration with a slowdown called the inflection point. The *starter* period is the period during which the poultry is experiencing rapid growth, and the *grower* period is the period of the poultry experiencing anatomical and physiological development in its limbs. The *starter* period for waterfowl such as Muscovy Duck and Mule Duck begins at the age of 0-3 weeks, the *grower* period is 4-10 weeks, and the *finisher* period is over 10 weeks (Chen, 1996).

The amount of feed consumed by livestock is used to provide for basic living and for the production of these animals (Tilman *et al.*, 1991). Factors that affect the consumption of rations include the body of muscovy duck or mule duck, daily activities, immune system, environmental temperature, quality and quantity of rations (NRC, 1994). Weight weighing should be done every week to find out the rate of weight growth of poultry. The speed of growth can be measured through weight gain at any given moment, against the weight of the previous week (Charles and Spackman, 1985). The use of standard feed that usually farm give is can be corn, bran, bran, menir, fermented onggor, molasses, soybean bungkil, and commercial feed (Ati, 2007).

Muscovy Duck and Mule Duck are two waterfowls animals that have different characteristics. The specific differentiators of these two waterfowls can be seen from the feathers, body shape, and legs as well as different weight growth rates. These differences are strongly influenced by environmental and genetic factors. Sex affects growth, in males have a larger size than females, in comparison

the body weight of the male is $3,622 \pm 342.41$ g while the body weight of the female is $2,493 \pm 413.70$ g (Tamzil, 2018). According to Harahap (1993), the average weight gain of male Muscovy Duck in the fifth week is 392.95 grams and the average weight gain of female Muscovy Duck in the fifth week is 287.57 grams. Wasito and Rohaeni (1994) said, the body weight of female Mule Duck aged 10 weeks reached 2.40 kg, and male Mule Duck aged 12 weeks weight about 4.30 kg (Zulkarnain 1992; Roesdiyanto and Purwantini 2001; Laksono, 2003).

1.6. Hypothesis

1. There is a difference in feed consumption between male Muscovy Duck and male Mule Duck at the growth age with commercial feed in each day.
2. There is a difference in body weight between male Muscovy Duck and male Mule Duck at the growth age with commercial feed in each week.
3. There is a difference in feed conversion ratio between male Muscovy Duck and male Mule Duck at the growth age with commercial feed each week.