

**ONLINE ISSN: 2548-3803**

**PRINT ISSN: 2548-5504**

# **Chalaza Journal of Animal Husbandry**

*Volume 3, No. 1, June 2018*



**Published by USN Scientific Journal Group, Indonesia**  
<http://www.usnsj.com/>

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## **Chalaza Journal of Animal Husbandry (CJAH)**

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**Table of Content**  
Volume 3, No. 1, June 2018

|                                                                                                                                                                |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Review the Productivity of Kampung Chicken with Bangkok Chicken on Extensive System Maintenance<br><i>Junaedi, Khaeruddin</i>                                  | 1-4   |
| Performance of Bali Cattle on Substitution Feeding Fermented Straw<br><i>Musdalifa, Bahri Syamsuryadi, Abdul Hakim Fattah</i>                                  | 5-11  |
| Physiological Response of Bali Cattle to Feeding Substitution of Balinese Fermentation Straw<br><i>Nurdiana, Bahri Syamsuryadi, Abdul Hakim</i>                | 12-17 |
| Percentage of Male Peranakan Ettawa Goat Non-Carcass Given Different Local Feed<br><i>Suparman</i>                                                             | 18-23 |
| Effect of Bulls on Birth Rate and Birth Weight by Using Semi-Intensive Bali Cattle Maintenance<br><i>Andi Anjar Wawo</i>                                       | 24-28 |
| The Local Chicken Breeders Levels Knowledge of the Implementation of Newcastle Disease Vaccination in Ulu Mowewe, Indonesia<br><i>Paisal Sandek, Sainuddin</i> | 29-34 |



## **Review the Productivity of Kampung Chicken with Bangkok Chicken on Extensive System Maintenance**

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### **ARTICLE INFO**

e-ISSN: 2548-3803

p-ISSN: 2548-5504

Vol. 3, No.1, June 2018

URL: <http://dx.doi.org/10.31327/chalaza.v3i1.462>

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### **Abstract**

This study aims to determine the ratio of productivity of chicken and Bangkok female maintained on an extensive system. A total of 4 female chickens and using four Bangkok females in this study. Keeping chickens from DOC until first production ( $\pm$  seven months). The maintenance system from DOC for up to 2 weeks is intensified using heating aid after two weeks of extensive maintenance. After the production (layer) is done recording (productivity recording) that is egg weight, number of eggs per period, the age of early parent spawn, and weight of mother early spawn as parameter observed in this research. Data result of the analysis is processed using T-test. The result showed that productivity of chicken and Bangkok female saw from the age of fresh parent eggs and weight of initial parent spawn. Chickens earlier lay eggs compared to chicken Bangkok, but the parent weight at the time of spawning is higher in Bangkok female chickens when compared to females.

**Keywords:** chicken, Bangkok chicken, productivity, extensive system

### **A. Introduction**

The community's need for animal protein increases every year. Local chicken is one of the potential sources of animal protein in Indonesia. Sidadolog (2007) that utilization and usefulness of local chicken are still traditional as a producer of meat and eggs, so it is often called chicken vegetable. Some other advantages of local chicken can survive and breed well despite low feed quality and resistance to disease. As germplasm of livestock Indonesia, these domestic chickens need to maintain and purified as well as the need to be optimally utilized for the supply of animal protein.

The excellence of local chickens causes local chickens are traditionally maintained generally apply the system extension is removing the chicken just like that regardless of the type and requirement of chicken feed. Extensive system maintenance has several advantages, among

them can save the cost of feed, give an opportunity for the chickens to exercise and given the freedom to do its natural behavior.

Kampung chicken and chicken Bangkok are one of the local chicken which is quite popular in Indonesia. Chicken is a type of local chicken that does not have specific characteristics, in this case, the diversity of phenotype and genotype are quite high. Chickens are easily recognizable because they roam almost in the villages of all regions in Indonesia. The ability of a chicken to produce eggs during a specific period varies greatly depending on its maintenance system. In keeping with a chicken complaint, Bangkok chicken is a type of local chicken. The morphology of Bangkok chicken is usually bigger and heavier than the chicken, so this chicken can also be used to increase the growth of chicken through cross-program (Mokodongan, Nangoy, Leke, & Poli, 2017). This study aims to determine the ratio of productivity of chicken and Bangkok female maintained on an extensive system.

## B. Methodology

### 1. The Material

Chicken Experiments used were four female chickens and four chickens Bangkok female. Keep chickens from DOC until first production ( $\pm$  seven months).

### 2. Research Procedures

System maintenance from DOC up to 2 weeks intensively by using heating aid after two weeks of excellent system maintenance, the research chicken released (spread) to find their food and at night put in the cage. Doing recording (productivity recording) that is the egg weight, the number of eggs per period after the production (layer), the initial mother's egg laying, and the influence of the initial mother lay eggs.

### 3. Parameters of Research

Parameters of this study were egg weight (gram), number of eggs per period, the age of first parent egg-laying (weeks), and importance of fresh parent egg (gram).

### 4. Data Analysis

Using the T-Test compare chicken with chicken Bangkok. With four replies. Test T by using the following formula (Sudjana, 2005).

$$t \text{ count} = \frac{X1 - X2}{\sqrt{\frac{(n1-1)s_{12} + (n2-1)s_{12}}{n1+n2-2} \left(\frac{1}{n1} + \frac{1}{n2}\right)}}$$

## C. Result and Discussion

Observation result showed that there was no significant difference ( $P > .05$ ) between egg weight and some eggs produced by chicken with Bangkok chicken. The egg weight from both types of chicken was 50.35-51.37 grams higher than the pressure of chicken eggs in the previous study that was 34,66gram (Ardika, Siti, Sukmawati, & Wirapartha, 2017), 39.33-42.33 gram (Hartono, Puger, & Nuriyasa, 2014), 40.74 grams (Sartika & Gunawan, 2007) and 36.7 grams in domestic poultry maintained on extensive systems.

**Tabel 1. Results of observation of chicken breeding productivity with chicken Bangkok on extensive system maintenance**

| Parameter                               | Type of Chickens              |                               |
|-----------------------------------------|-------------------------------|-------------------------------|
|                                         | Bangkok                       | Kampung                       |
| Egg weight (gram)                       | 51.37 $\pm$ .33               | 50.35 $\pm$ .76               |
| Number of eggs / period (item)          | 11 $\pm$ .64                  | 13.5 $\pm$ 0.91               |
| Early motherhood spawn (weeks)          | 24.25 $\pm$ 0.41 <sup>a</sup> | 22 $\pm$ .25 <sup>b</sup>     |
| The early weight of mother's egg (gram) | 2010 $\pm$ 36.97 <sup>a</sup> | 1770 $\pm$ 26.46 <sup>b</sup> |

Description: Superscripts on the same line show significant differences ( $P < .05$ )

Some of the main factors that can affect the variation of the number of eggs and the weight of chicken eggs produced are feed, genetic, parentage, and ambient temperature. According to Leeson & Summers (2005) proteins and amino acids (especially methionine) are the most critical dietary substances in controlling egg size, in addition to genetic and poultry body size. In extensive system maintenance, chickens that consume traditional feeds produce lower egg weight when compared to chickens fed with commercial supplements (Barocio-Urue, Juárez-Caratachea, Gutiérrez-Vázquez, Pérez-Sánchez, & Ortiz-Rodríguez, 2017). The egg weight is also affected by the age of the chicken (Padhi, Chatterjee, Haunshi, & Rajkumar, 2013), age affects yellow and egg whites (Ahn, Kim, & Shu, 1997). The weight of poultry eggs maintained in environments with high temperatures is lower than that kept at low environmental temperatures.

Parentage and parent weight at baseline of egg-laying showed significant differences ( $P < .05$ ). At the period of 24 weeks, chicken Bangkok starts laying eggs while the village chickens lay eggs earlier that is at the age of 22 weeks. The chicken reaches the adult for about five months and produces 10-15 eggs per period. The weight of the hen in Bangkok in the early period of egg laying is 2010 gram heavier than the weight of broiler chicken 1770 grams. It is by the opinion of Rahayu, Widodo, & Sarunggallo (2010) which states that the increase in body weight of Bangkok chicken is relatively higher than the chicken in general, so the body weight of Bangkok chicken is generally higher than the chicken.

Early age and weight of the mother spawn in this study was higher than previous studies which found that the importance of broodstock at 1485.2 grams with the first age of laying 174.93 days (Sartika & Gunawan, 2007). According to them that when the first age spawns slowly, the egg production decreases, the parent weight is smaller so that it gets the first egg weight and the average egg weight for six months is smaller. The importance of the first spawning parent is also positively correlated with the first egg weight.

#### D. Conclusion

The Productivity of chicken and female Bangkok saw from early age of parent in the initial spawn and initial parent's weight of egg-laying, early birds, lay eggs when compared to Bangkok chicken, but the parent weight at the time of layer higher in Bangkok chicken.

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## Performance of Bali Cattle on Substitution Feeding Fermented Straw

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### ARTICLE INFO

e-ISSN: 2548-3803  
p-ISSN: 2548-5504  
Vol. 3, No.1, June 2018  
URL:<http://dx.doi.org/10.31327/chalaza.v3i1.527>

### Abstract

The purpose of this research is to know the increase of body weight, feed consumption, feed efficiency and conversion of Bali cattle feed given fermented straw as substitution of Elephant Grass. The method used in this Experimental study Method with Randomized Block Design with four treatments and three replications. P2: Elephant Grass 100% (control) P1: Elephant Grass 75% + 25% fermented straw, P2 treatment: Elephant Grass 50% + 50% fermentation straw and P3 Treatment: 25% Grass + Finger straw 75 %. The observed changes were weight gain (kg/day), feed consumption (kg/day), feed efficiency and feed conversion in Bali cattle. The data obtained were analyzed in various ways with Duncan. The result of this research showed that by giving substitution of fermented straw to determine the performance of bovine cow have a real effect ( $P \leq 0.05$ ) to the value of body weight gain, feed consumption, feed conversion and efficiency of feed. It shows that with the difference of feeding substitution of fermented straw can give the real effect on the increase of body weight of Bali cattle with feeding of forage grass 50% elephant + 50% fermented straw.

**Keywords:** Bali cattle, performance, straw fermentation

## A. Introduction

Bali cattle is one of the original Indonesian animals that has excellent potential to be developed. The origin of this Bali Cow is a bull (*Bos sondaicus*) that has been domesticated or domesticated for many years. The long domestication process is thought to be the cause of lesser than the beast. Based on the breed (race) pure, classifying the cow into 3 (three) cows, namely European cows (*Bos Taurus*), the nation of cattle India (*Bos indicus*), and the nation of Bali cattle (*Bos sandwiches*). Bali cow (*Bos sandwiches*) is the original Indonesian cow that becomes suspect as the result of domestication (taming) of the wild bull. Some experts believe that the domestication takes place in Bali so-called (Guntoro, 2002). Bali cow is known as a cow that has the excellent adaptability to environmental conditions are very extreme tense. In these conditions, Bali cattle still have a high carcass production (Guntoro, 2002).

Processing of rice straw can be ammonia or fermentation which can increase the nutrient also can preserve the straw feed material Agus, Suwignyo, & Utomo (2005). Processing used is the fermentation of rice straw by using probiotics. Probiotics is a natural ingredient additive that can improve digestibility in the form of microbes. Cellulosic microbes in probiotics will produce cellulose enzymes that can break the lignocellulose bond so that that digestibility can increase. Fermented rice straw with probiotics can improve the digestibility of in vitro dry matter and organic matter Syamsu, Yusuf, & Abustam (2002). The purpose of this research is to know the performance of mother cows with feeding substitution of fermentation straw.

## B. Methodology

### 1. *The material*

The materials used in this research are 12 female of Bali cows, Elephant Grass, Fermented Straw. The tools used in this research are Thermometer, Hygrometer, Anemometer, Chopper Machine, Measuring Band and Sitting Scale, Rope, Three Wheel Motor, Bucket, Sickle.

### 2. *Research design*

This research was conducted using Randomized Block Design (RBD), which consisted of 4 treatments that were repeated three times so that there were 12 experimental units. The research included 4 P0, P1, P2, P3 treatment factors.

Treatment rations used consisted of four kinds, namely:

- P0: Elephant grass 100%
- P1: Elephant grass 75% + fermented straw 25%
- P2: Elephant grass 50% + fermented straw 50%
- P3: Elephant grass 25% + fermented straw 75%.

### 3. *Research procedures*

#### a. Preparation phase

In the preparation phase which lasted for one week, the activities are:

- a) Preparation of intensive cage capacity 12 tail, size 2 m x 1.5 m / head / plot.
- b) Cattle health examination of the research.
- c) Approach the place within the cage for each cattle.
- d) Adapting to the cattle to be studied.
- e) Feeding:
  - 1) Taking elephant grass at 6 am.
  - 2) Provision of the available fermented straw cage.
  - 3) Provision of drinking water in ad libitum and beat during the daytime.

#### b. Microclimatic measurement

##### a) Cage Temperature.

The temperature was measured using a thermometer each mounted in a cage plot (front, center, and back) inside the enclosure of the thermostat 50 cm from the enclosure floor. Take data three times a day, which is at 7 am, 12 am, and 5 pm.

##### b) Cage humidity.

Humidity is measured using a hygrometer each of which is mounted in a cage plot (front, center, and back) inside a hygrometer mounting cage located 50 cm from the cage floor. Data is taken three times a day at 7 am, 12 am, and 5 pm.

## c) Temperature Humidity Index (THI).

Temperature Humidity Index (THI) measured using a dry and wet thermometer installed in each cage of the damp and dry thermometer layers 50 cm from the cage floor. Data is taken three times a day at 7 am, 12 am, and 5 pm.

Calculating of THI by using the following formula (Rohman & Boer, 2000):

$$\text{THI of Beef Cattle} = T - 0,55 \times (1 - rH/100) \times (T - 58)$$

Explanation:

THI : temperature-humidity index ( $^{\circ}\text{C}$ )

T : temperature in  $^{\circ}\text{F}$

Rh : humidity

## d) Performance of Bali Cattle

## 1) The increase of Body Weight.

Body weight gain of Bali cattle was measured by using a measuring tape and then saw the weight table of Balinese cow body weighted from Lampung Veterinary Centre 2014. The daily weight gain (DWG) of experimental cattle resulted from the difference between the final weight of the observation period and the initial body weight of the observation period divided the long period of observation. DWG is calculated using equations:

$$\text{DWG} = \frac{\text{WT} - \text{WO}}{\text{T}}$$

Explanation:

Wt : weight of livestock at the end of observation period (kg)

Wo : the weight of livestock at the beginning of the observation period (kg)

T : long observation time

## 2) Feed consumption.

A calculation of the difference in feeding with residual is the definition of feed consumption. Calculated based on the amount of feed given minus the rest of the feed (kg).

$$\text{Feed Consumption (kg)} = \text{Giving (kg)} - \text{residual (kg)}$$

## 3) Feed Conversion Ratio (FCR)

Feed Conversion Ratio (FCR) is a unit to calculate the efficiency of feed on the cultivation of fattening and fattening. By calculating the FCR of cattle will significantly help us in the effectiveness of feed that we will use FCR calculation results with small numbers means the given feed is getting better. The formula for calculating the FCR is the amount of feed during maintenance divided by the total body weight of cattle. The method of Feed Conversion Ratio (FCR):

$$\text{FCR} = \frac{\text{The amount of feed consumed (kg)}}{\text{The resulting weight (kg)}}$$

## 4) Feed efficiency.

Feed efficiency is the ratio between the increase of body weight produced with the feed consumed, with the following formula:

$$\text{Feed Efficiency} = \frac{\text{Body Weight Gain (kg)}}{\text{Feed Consumption (kg)}}$$

## 4. Parameters of Research

- a. Microclimatic parameters at the time of study include temperature, humidity, THI.
- b. Livestock performance parameters include weight gain, feed intake, *Feed Conversion Ratio* (FCR), feed efficiency.

## 5. Data analysis

All data obtained in this study, its variance was analyzed by using Randomized Block Design (RBD) unidirectional pattern to know the effect of treatment on the observed changes.

The mathematical model by using the following formula:

$$Y_{ij} = \mu + \alpha_i + \epsilon_{ij}$$

Explanation:

$Y_{ij}$  : The observed value of treatment of i-group and j-group

$\mu$  : The middle observation value is common

$\alpha_i$  : The effect of the I-th treatment

$\epsilon_{ij}$  : Error (error) experiment on the treatment of i-th and j-th group

Knowing the impact of the treatment on the measured parameter, the data obtained were analyzed by vocabulary with the help of SPSS 21 software. If the therapy showed real effect, then LRD test (Suhaimi, 2001).

## C. Result and Discussion

### 1. Microclimatic environment

To observation of microclimate condition at cage Berdikari Mallomo Utama (BMU) Animal Husbandry Cenrana Village Kahu District Bone District Environmental Condition during research from 7.30 am – 5 pm. The average temperature of the enclosure is 28.65°C, and the humidity of the cage is 78.27% with THI 40.41% being in comfortable condition. Table 1 shows the microclimatic average in the cage.

**Table1. The mean value of Microclimatic in the cage during the research**

| Microclimate | Morning<br>(7 am) | Afternoon I<br>(12 am) | Afternoon II<br>(5 pm) | Average |
|--------------|-------------------|------------------------|------------------------|---------|
| Temperature  | 24.56°C           | 33°C                   | 28.38°C                | 28.65°C |
| Humidity     | 85.31%            | 68.19%                 | 81.31%                 | 78.27%  |
| THI          | 38.63%            | 42.23%                 | 40.37%                 | 40.41%  |

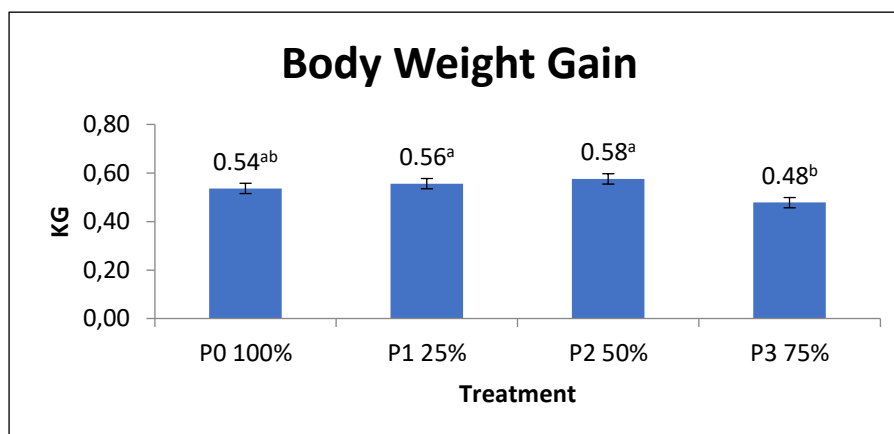
Table 1 explains that the fluctuation of the enclosure temperature with the temperature of the cage in the morning ranges from 24-56°C and experienced important warning during the day at 33°C and gradually decreasing until the afternoon at 28.38°C. It is the same statement of Yulianto & Saprianto (2010), also explains that the air temperature standard in the beef cattle comfort zone is in the range of 27-34°C the temperature is also still by the safe area of beef cattle in the tropics like Indonesia in general. The humidity of the cage in the morning ranges from 85.31% during the day 68.19% and the afternoon is 81.31%. Too high humidity can trigger the presence of disease (dust and fungi), so considered as a determinant of livestock health it is one of the climatic elements.

The results obtained are in comfortable condition due to the temperature of the cage in the morning 24.56°C, and humidity ranges 85.31% and THI 38.63%. By the opinion of Chase & Larry (2006) that THI <72 said that with these environmental conditions the cow is in a comfortable situation and does not cause stress on cattle.

### 2. Performance of Bali Cattle

#### a. Body Weight gain of Bali Cows

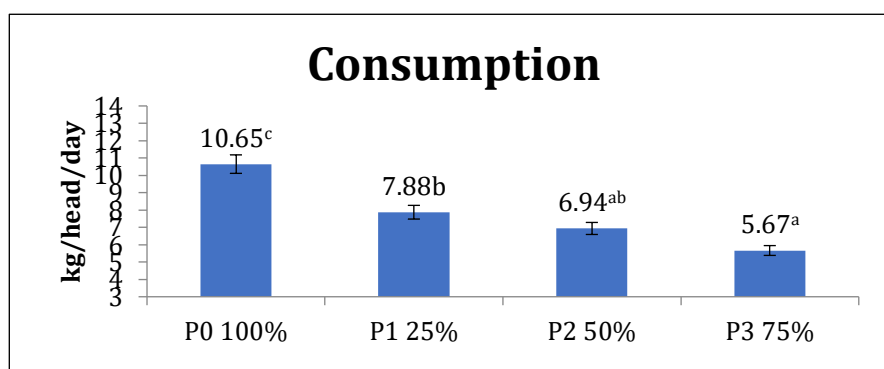
The average daily weight gain of Bali cattle at different ages during the research (Figure 1).



Description: superscripts a, ab and b on the same line indicate the effect real ( $P \leq .05$ ).

**Figure 1. Average daily weight gain of Bali cattle**

The result of variance analysis showed that the feeding of fermented straw had a very significant effect of  $P \leq .05$  on the increase of body weight of the parent of Bali cattle. The average daily weight gain of cattle ranged from .48 to .58 kg / head / day, the highest was in P2 treatment i.e. 50% forage grass elephant + 50% fermented straw of .58 + .03 kg/head/day. The average consumption of Bali cattle feed during the study is shown in Figure 2.



Description: superscript a, ab and b on the same line indicate authentic effect ( $P \leq .01$ )

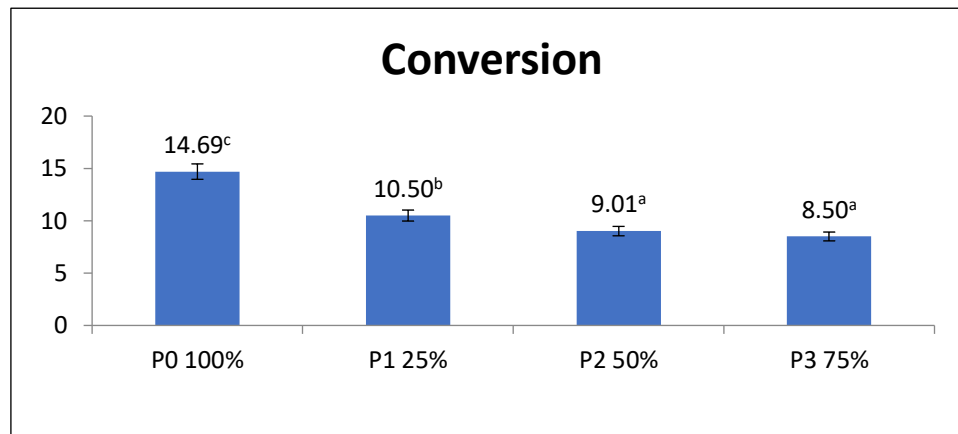
**Figure 2. Average consumption of Bali cattle feeds on the substitution of fermented straw.**

The result of variance analysis showed that the feeding substitution of fermented straw gave an authentic effect of  $P \leq .01$  by treatment of P1, P2, P3, and P0. It is that means of feed consumption in P0 treatment, showed that consumption was as high as 10.65 + 1.44 kg/head/day, then respectively decreases in P1, P2 and P3 apiece 7.88 + .29 kg / head / day, 6.94 + .16kg / head / day and 5.67 + .84 kg / head / day. It is due to feed consumption of livestock affected by the quality of feed and environmental conditions of maintenance.

#### *b. Feed conversion*

The average feed conversion of Bali cattle feed during the research is shown in Figure 3. Conversion value of feed will be more efficient if the amount of feed consumed less but produce PBBH higher or equal. The lowest feed conversion value of the three treatments was achieved by treatment (P3) i.e. 8.50 + 1.14 followed by treatment (P2) 9.01 + .40, (P1) 10.50 + .38 and (P0) 14.69 + 2.79.

The result of variance analysis showed that the treatment gave a significant effect on feed conversion  $P \leq .05$  because the consumption of dray matter (DM) and DWG produced had a real impact. It indicates that the higher the level of fermented straw provided, the lower the feed conversion. It shows the result of fermented straw decrease feed conversion

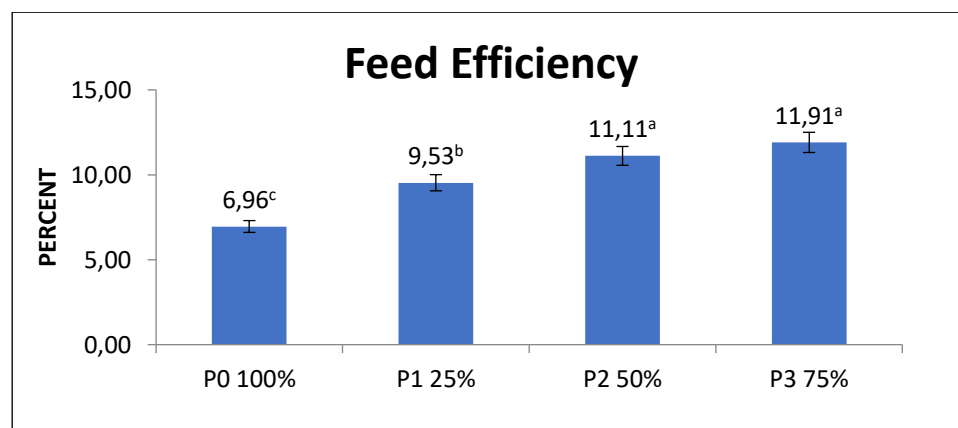


Description: superscript a and b on the same line show a significant effect ( $P \leq 0.05$ )

**Figure 3. Average convention of Bali cattle feeds substituted with fermented straw.**

#### c. Feed efficiency

The average efficiency of bovine feed during the research (Figure 4).



Description: superscript a and b on the same line show a significant effect ( $P \leq 0.01$ )

**Figure 4. Average cows feed efficiency with fermented straw substitution feed.**

The result of variance analysis showed that feeding substitution of fermented straw had a significant effect on feed efficiency where  $P \leq 0.01$  with treatment P1, P2, P3, and P0. The feed efficiency obtained from this study ranged from 6.96 - 11.91%. The results of this study differed from Akbar (2007) who reported that the feed efficiency of sterilized fermented palm bunches combined with defaunation and protein bypass rumen in local sheep was 4.86 to 13.41%. Siregar (2001), which states that the efficiency of feed used for cattle ranges from 7.52 to 11.29%.

#### D. Conclusion

The conclusions of the results and discussion of research were that the difference of feeding substitution of fermented straw could give effect to the increase in body weight, consumption, conversion, and efficiency of feed.

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## Physiological Response of Bali Cattle to Feeding Substitution of Balinese Fermentation Straw

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### ARTICLE INFO

e-ISSN: 2548-3803

p-ISSN: 2548-5504

Vol. 3, No.1, June 2018

URL: <http://dx.doi.org/10.31327/chalaza.v3i1.538>

### Abstract

This study aims to see the physiological response of Bali cattle to the feeding of fermented straw substitution. A total of 12 head of Bali cattle average age five years. This research was conducted from August to September 2017 in Cenrana Village, Kahu Sub-district, Bone District, which is a location in the business of Berdikari Berdikari Mallomo Utama. This study used a randomized block design (RBD) with 4 treatments and 3 replications so that there were 12 experimental units, the procedure was P0: 100% elephant grass + 100% fermentation control, P1: elephant grass 75% + generation fermentation 25%, P2: 50% elephant grass + 50% fermenting straw, and P3: Elephant grass 25% + 75% fermentation straw. The parameters observed were body temperature, respiration rate, and liver rate. The data obtained were analyzed variance and continued with LRD test. The results showed that the substitution of hay fermentation had a significant effect ( $P < .01$ ) on the physiological response of Balinese cow heart, but no significant effect ( $P > .05$ ) to the body temperature and the rate of respiration of Bali cattle. The conclusion that by giving fermented straw substitution feed provide an effect on heart rate (58.33 / min) with treatment 25% elephant grass + 75% fermented straw in the normal range for Bali cattle.

**Keywords:** female Bali cattle, physiological response, fermentation straw

## A. Introduction

Bali cattle is an ideal animal slaughtered regarding meat production due to its low-fat content, great reproductive aspect due to high fertility, has the superb adaptability to the new environment, both on air temperature, humidity and wind, and resistant to the condition of land, feed, and disease Guntoro (2002).

Cattle get hot from metabolic and environmental activities, will lose heat through convection, radiation, conduction, and evaporation. Livestock adaptation to the environment is a form or behavior trait intended to survive or reproduce in a particular situation. The improper climate can lead to changes in the physiological status of cattle called stress or stress. Livestock affected by weight will show behavior changes the way animals to cope or reduce stress is by adjustment, both genetically and phenotype. Explained further increase in breath frequency and body temperature will affect with growing pulse rate. The purpose of this study is to determine the physiological response of Bali cattle to the feeding substitution of fermented straw.

## B. Methodology

### 1. *The material*

The materials used in this study are elephant grass, fermented straw, and 12 female calves. Which maintaining in the business of Berdikari Mallomo Utama farm, Cenrana Village, Kahu Sub-district, Bone District.

The tool used in this research is Thermometer, Stethoscope, Stopwatch, Haigrometer, Rope, Wet Tissue, Bucket, Book, and Pen.

### 2. *Research design*

This research was conducted using Randomized Block Design (RBD), consisting of 4 treatments that were repeated three times so that there were 12 experimental units. This research includes four factors of therapy of P0, P1, P2, and P3.

Treatment rations used consisted of four kinds, namely:

- P0: Elephant grass 100%
- P1: Elephant grass 75% + fermented straw 25%
- P2: Elephant grass 50% + 50% fermentation straw
- P3: Elephant grass 25% + 75% fermented straw.

### 3. *Research procedures*

#### a. Preparation phase

In the preparation phase which lasted for one week, the activities are:

- a) Preparation of intensive cage capacity 12 tail, size 2 m x 1.5 m / head / plot.
- b) Observe Animal health inspection in the study.
- c) Approach the place within the cage for each cattle.
- d) Adapting to the cattle to be studied.
- e) Feeding:
  - 1) Taking elephant grass at 6 am
  - 2) Provision of the available fermented straw cage.
  - 3) Provision of drinking water in ad libitum and beat during the daytime.

#### b. Microclimatic measurement

##### a) Environmental temperature

The temperature was measured using a thermometer mounted in a first cage plot inside a thermometer fixing cage located 50 cm from the cage floor. Recording data is three times a day, which is at 7 am, 12 am, and 5 pm.

##### b) Moisture cage.

Humidity was measured using a hygrometer mounted in a front cage housing the hygrometer mount was 50 cm from the cage floor. Data is taken three times a day at 7 am, 12 am, and 5 pm.

##### c) Temperature Humidity Index (THI).

Wet and dry temperature or THI is measured using a dry, and damp thermometer mounted in front of the cage, damp and dry thermometer installation is 50 cm from the cage floor. Data is taken three times a day at 7 am, 12 am, and 5 pm.

Calculating of THI by using the following formula (Rohman & Boer, 2000):

$$\text{THI of Beef Cattle} = T - 0,55 \times (1 - rH/100) \times (T - 58)$$

Explanation:

- THI : temperature-humidity index (°C)  
 T : temperature in °F  
 rH : humidity

c. Physiological Measurement of Livestock

a) Body temperature.

The thermometer to be used is clean and dry, carefully lifted the cow's tail up, then insert the tip of the thermostat (1/3 part) into the rectum for about 10 seconds, observed how the cow's body temperature is indication on scale thermometer, data taken 3 times a day, i.e., at 7 am, 12 am, and 5 pm.

b) Respiration rate.

Doing Respiration Rate Measurement by attaching a stethoscope to the chest or neck so that the sound of breath sounds. The frequency of breathing is a calculation for one minute using the stopwatch in duplicate. Taking Data is three times a day, which is at 7 am, 12 am, and 5 pm

c) The frequency of Cattle Heartbeat

Heart rate measurement is a performance by attaching a stethoscope to the chest near the front of the cow's quadriceps, the number of pulses or Rothko sound is counting for one minute using the stopwatch in duplicate. Taking Data is three times a day, which is at 7 am, 12 am, and 5 pm.

4. *Parameters of Research*

- a. Microclimatic at the time of study include temperature environment, humidity, and THI.  
 b. Physiological parameters include body temperature, respiration rate, and heart rate.

5. *Data analysis*

All data obtained in this study analyzed its variance by using Randomized Block Design (RBD) to determine the effect of treatment on the observed changes. The mathematical model by using the following formula:

$$Y_{ij} = \mu + \alpha_i + \epsilon_{ij}$$

Explanation:

- A : treatment  
 I : groups  
   : 1, 2, 3, ... n  
 Y<sub>ij</sub> : The observed value of the i-th treatment and the j-group  
 μ : The middle observation value is common  
 α<sub>i</sub> : The effect of the i-th treatment  
 ε<sub>ij</sub> : Error (error) experiment on the treatment of i and group j

Finding out the effect of treatment on measured parameters, so the data obtained were analyzed by vocabulary with the help of SPSS software. If the therapy exhibits a real impact, then the LRD test is performed (Suhaimi, 2001)

**C. Result and Discussion**

1. *Microclimatic environment*

Table 1 showed results of observation of microclimate conditions in the cage BMU Berdikari Mallomo Utama Ranch Cenrana Village, Kahu District, Bone District Environmental Condition during the study.

**Tabel 1. the mean value of Microclimatic with the substitution of fermented straw feed**

| Microclimate | Morning<br>(07.00) | Afternoon I<br>(12.00) | Afternoon II<br>Sore (17.00) | Average |
|--------------|--------------------|------------------------|------------------------------|---------|
| Temperature  | 24.56°C            | 33°C                   | 28.38°C                      | 28.65°C |
| Humidity     | 85.31%             | 68.19%                 | 81.31%                       | 78.27%  |
| THI          | 38.63%             | 42.23%                 | 40.37%                       | 40.41%  |

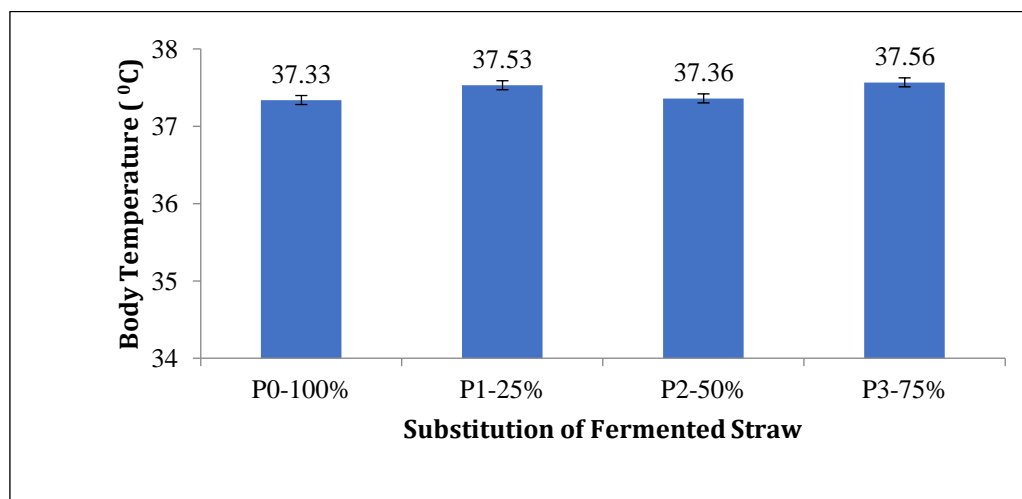
Source: Primary data that have processed, 2017

Table 1 shows the average obtained temperature of the cage is 28.65°C, and the humidity of the pen is 78.27% with THI 40,41%. It can explain that the fluctuations in the morning temperatures ranged from 24.56°C and experienced significant warning during the day 33°C and gradually decreased until the afternoon at 28,38°C temperature range, the environmental temperature value has the potential to provide day physiologic stress on Bali cattle by giving elephant grass and fermented straw, higher heat load leads to decreased appetite in livestock. It is suitable with Yulianto & Saprianto (2010). Also explained that the standard air temperature in the beef cattle comfort zone is in the range of 27-34°C, the heat is also from the safe area of livestock in tropical regions like Indonesia in general. Relative humidity indicates a value that is opposite to the ambient temperature. Average humidity during the study in the morning of 85.31% during the day 68.19% and afternoon 81.31% can see that the average moisture is normal to calculate the life of beef cattle. The average THI value also experienced the same change in the environmental temperature, i.e., in the morning about 38.63% then increased to 42.23% and decreased to 40.37%.

## 2. Animal Physiological Response Measurements

### a. Body temperature

Body temperature indicates the body's ability to release and receive heat. Measurement of body temperature is inherently tricky since the frequency of body temperature is the resultant of various rates in various places Figure 1 shows the body temperature of the cow by substitution of the fermented straw.



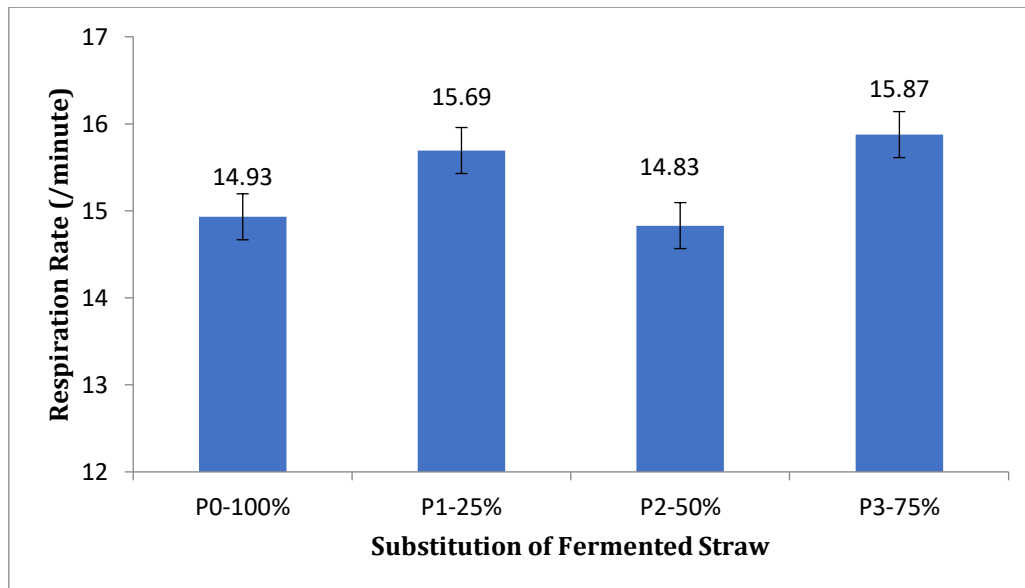
**Figure 1. The average body temperature of Bali cattle fed with the substitution of fermented straw.**

The result of variance analysis showed that fermented straw substitution feeding on Bali cattle had no significant effect ( $P > .05$ ) to body temperature i.e. P0 (37.34 + .16) °C, P1 (37.53 + .04) °C, P2 (37.36 + .28) °C, and P3 (37.56 + .06) °C are still in the normal range, this is supported by Santosa, Bambang, & Agus (2004), which states that the normal body temperature range in cattle is 37°C up to 39°C.

This study showed that body temperature at P3 treatment (37.56 + .06) °C did not differ much with treatment of P1 (37.53 + .04) °C, compared P2 (37.36 + .28) °C. It is due to the feeding with high protein level that is 9.11% nutrient content of fermented straw does not affect the body temperature of Bali cattle, because of cow able to do thermoregulation process through mechanism homeostasis in the body.

### b. Respiration rate

Respiration is the process of taking oxygen from the air and the release of carbon dioxide from the network through the lungs, breathing is a biochemical process done by animals to obtain energy. Breath plays a role in regulating the acidity of extracellular fluids in the body, helping with temperature control, water elimination, and sound formation.



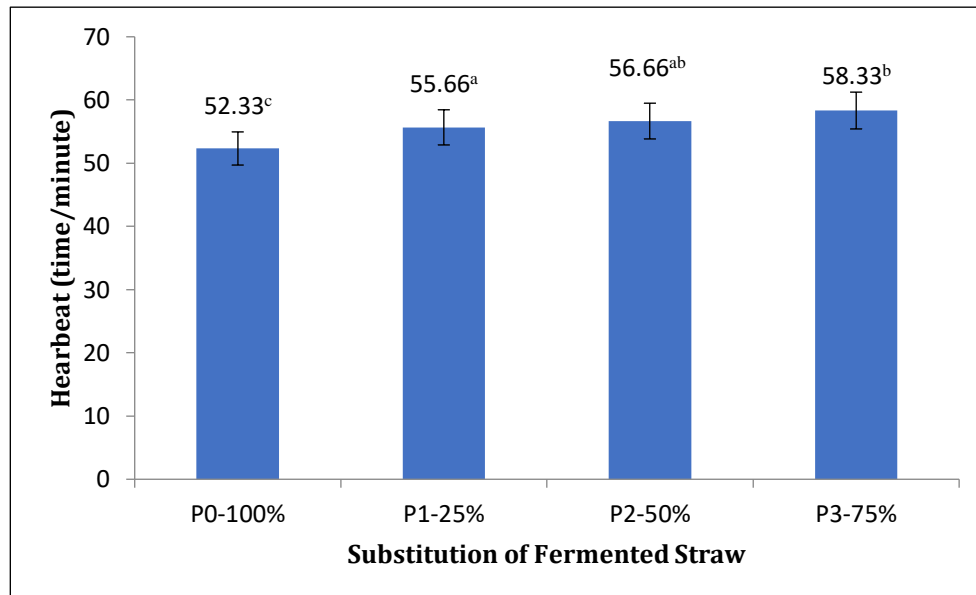
**Figure 2. Average value of the respiratory rate of Bali cattle fed with fermented straw substitution.**

The result of variance analysis showed that the substitution of fermented straw in animal feeding had no significant effect ( $P > .05$ ) to the rate of respiration of Bali cattle. The mean obtained during the study in Figure 5. P0 (14.93 + .34 / min), P1 (15.69 + .61 / min), P2 (14.83 + 1.03 / min) and P3 (15.87 + .36 / min) is still in normal condition. According to the opinion of Akoso (2008) Frequency of breathing every minute for animal species is not the same, in adult cattle ranged from 12 to 16 times per minute, while in young cows between 27-37 times per minute.

It is explained that the value of P1 (15.69 + .61 / min), P2 (14.83 + 1.03 / min) and P3 (15.87 + .36 / min) have no effect on the respiration rate produced, feed consumption tends to be higher at P3 (15.87 + .36 / min) did not differ significantly with P1 (15.69 + 0.61 / min) compared with P2 treatment (14.83 + 1.03 / min). It is due to the increased metabolism in the body; this increase resulted in the cows having heat stress, high environmental temperatures during the day, in maintaining the body's heat balance the cow seeks to remove heat by accelerating the rate of respiration.

### c. The frequency of Cattle Heartbeat

The function of the heart is to pump blood throughout the body Blood can bring O<sub>2</sub> throughout the body and bring CO<sub>2</sub> to the lungs, besides the blood can also function in carrying and flattening the heat in the body.



Description: Superscript a, b and ab showed very significant effect ( $P < .01$ ).

**Figure 3. The average value of Balinese heart rate with Fermentation Straw Substitution.**

The result of variance analysis showed that substitution of fermented straw with different treatment had a significant effect ( $P < .01$ ) on Balinese heartbeat. The mean heart rate obtained during the study was P0 ( $52.33 + .57 / \text{min}$ ), P1 ( $55.66 + .57 / \text{min}$ ), P2 ( $56.66 + .57 / \text{min}$ ) and P3 ( $58.33 + 0.57 / \text{min}$ ) explained that the heart rate obtained in the substitution of fermented straw at treatment P3 ( $58.33 + .57 / \text{minute}$ ) i.e. P2 ( $56.66 + .57 / \text{min}$ ) compared with P1 ( $55.66 + .57 / \text{min}$ ). It is by the opinion of Akoso (1996), i.e., the heart rate in normal conditions of a cow is between 40-60 times per minute.

#### D. Conclusion

Based on the results and discussion of research, it can give the conclusion that the feeding substitution of fermented straw gives a real effect on heart rate ( $58.33/\text{min}$ ) with the treatment of 25% elephant grass + 75% fermented straw, mass is in the normal range for Bali cattle.

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## Percentage of Male Peranakan Ettawa Goat Non-Carcass Given Different Local Feed

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### ARTICLE INFO

e-ISSN: 2548-3803

p-ISSN: 2548-5504

Vol. 3, No.1, June 2018

URL: <http://dx.doi.org/10.31327/chalaza.v3i1.608>

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### Abstract

This study aims to see the percentage of non-carcasses of male Peranakan Ettawa goats as many as six heads fed different local feed, analysis study was using analysis of variance using Completely Randomized Design (CRD) and the parameters measured in this study were non-carcass percentage including skin, head, legs, liver, spleen, lung, trachea, heart, testis, omental fat, and tail. The average of noncore rate obtained during P1 (100% mulberry) research was 70,58%, P2 (50% mulberry and 50% Gamal) was 72,25, and P3 (100% Gamal) was 62,305. Based on the analysis of variance, the result showed that different local feeding at 100% level in this study also had no significant effect ( $P < .05$ ) on the increase of non-carcass weight of male Peranakan Ettawa goat.

**Keywords:** non-carcass, the male Peranakan ettawa goat, and local feed.

### A. Introduction

Goat is a medium-sized ruminant animal, which is generally cattle that is not too difficult in its maintenance because the type of feed given is quite varied such as turn leaf, Lamtoro, jackfruit and others. Intensely maintained goat productivity could get support by proper forage feeding as well as concentrates with appropriate composition, disease management, post-harvest handling and marketing and goat breeds and age. Goat productivity can be from measurement by weight gain and weight and percentage of carcass and non-carcass produced. Factors affecting the body and carcass components are livestock, ration or feed, age, and sex. One of the factors that influence the percentage of some carcass (offal) is gender.

Ettawa Peranakan goats fed with good quality will produce a high body weight so that the pressure of the pieces obtained is also high. High cut loads will affect carcass and non-carcass weight on Ettawa Peranakan goat. Some factors that may affect the non-carcass production of livestock are the nation, age, gender, growth rate, cutting weight and nutrition (Berg & Butterfield, 2005).

The main expected result from beef cattle is the meat that is part of the carcass. In Indonesia, in addition to non-carcasses still have a high economic value, because some components of non-carcass element consumed by the community.

By this thought, it is necessary to research the percentage of non-carcasses on male Ettawa Peranakan goat fed different local feed. The purpose of this study was to determine the rate of non-carcass of male Ettawa Peranakan goat fed with separate local feed. The benefit of this research is to give information about the effect of different local feeding in the form of Gamal leaves and mulberry leaves to the percentage of the non-carcass component produced by male goat Ettawa.

## B. Methodology

### 1. The material

The material used in this research is Ettawa Peranakan goat with six tail with six month-12 month age range. The elements used are forage (Gamal leaf, mulberry leaf), water, and medicine.

The tools used in this study are individual cages, feeding places, drinking places, machetes, digital scales, scopes, buckets, basins, tape meters, painters, hacksaws, knives, swords, and table cutting.

### 2. Research procedures

The research method used in this research is Completely Randomized Design (CRD) (Steel & Torrie, 1991). In this study consisted of 3 treatments and three replications for each feed treatment. The therapies were (P1) with 100% mulberry diet, (P2) with 50% mulberry + 50% Gamal, and (P3) feed with 100% Gamal.

The action consists of 3 treatments and 2 replicates for each feed, namely:

1. P1 = 100% Murbei
2. P2 = 50% Murbei and 50% Gamal
3. P3 = 100% Gamal.

### 3. Parameters of Research

The parameters measured in this study are:

- a. Cut weight (final weight)
- b. Non-carcass loads include skin, head, legs, liver, spleen, lungs, trachea, heart, testis, omental fat and tail
- c. Counting percentage of non-carcass weight.

### 4. Analysis data

The study was prepared under Completely Randomized Design (CRD). The mathematical model by using the following formula (Steel & Torrie, 2006):

$$Y_{ij} = \mu + P_i + \epsilon_{ij}$$

The explanation:

- i : 1, 2, 3, ....., p  
 j : 1, 2, 3, ....., u  
 Y<sub>ij</sub> : observation of i<sup>th</sup> treatment and the j<sup>th</sup> repeat  
 μ : General Average  
 P<sub>i</sub> : the effect of the i<sup>th</sup> treatment  
 ε<sub>ij</sub> : error of treatment i and j<sup>th</sup> repeat

Knowing the effect of treatment on the measured variable, so the data obtained were analyzed by linguistic analysis and statistical analysis if the therapy showed a real impact, then it was recommended with turkey (real smallish different) (Steel & Torrie, 2006).

## C. Result and Discussion

### 1. Cutting weight

Based on the outcome of research, the mean of reducing weight on goat of male Peranakan Ettawa was obtained P1 for 10537.5 gram with mulberry 100% feed, for P2 treatment mean of cut weight of 10795 gram with 50% mulberry and 50% Gamal, mean-weight cut on P3 with 100% Gamal feed of 12945 grams (Table 1).

**Table 1. Average cutting weight on Peranakan Ettawa male goats**

| Age Group (Year)                | Frequency (Man) |       |        | Sig                |
|---------------------------------|-----------------|-------|--------|--------------------|
|                                 | P1              | P2    | P3     |                    |
| Cutting Weight                  | 10537.5         | 10795 | 12945  |                    |
| Percentage of Non-Carcasses (%) | 70.575          | 72.25 | 62.305 | 1.13 <sup>ns</sup> |

Description: \* = Real Effect ( $p > .05$  or  $p > 5\%$ ); \*\* = Very Significant Impact ( $P > .01$  or  $P > 1\%$ ); ns = No significant effect ( $P < .01$  or  $< 1\%$ )

Source: Data Processed, 2016

The highest weight of cutting weight was on P3 treatment with the weight of 12945 gram to feed 100% Gamal, while the mean of lowest cutting weight was on treatment of P1 with the cut weight of 10537.5 gram. However, the significant level of the male is goat weights 1.13. It shows that local feeding is different at 100% level which has no significant effect on the increase of male goat weight of male Peranakan Ettawa. It means that each type of feed consumed does not affect the cutting weight of the male Ettawa Peranakan goat, can be seen in Figure 1.

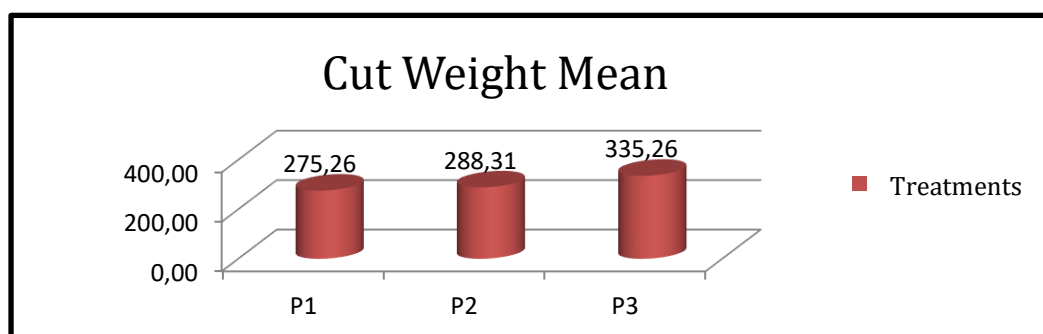


Figure 1. Mean Weight Cut of Male Peranakan Ettawa Goat.

One of the factors affecting cutting weight on a male Ettawa Peranakan goat is the consumption of different local feed. Their growth also influences the cut loads on male Ettawa Peranakan goats due to the use of dry matter feed. It is reinforced by the statement (Berg & Butterfield, 2005) that factors that may affect the non-carcass production of livestock are growth and nutrition.

## 2. Non-Carcass Weight

Ettawa male Peranakan goats with different local feeds had a significant effect ( $p > .05$ ) on carcass weight at each treatment. Non-carcass weight obtained is in line with the weight of the resulting cut, the higher the mass of reduction, then the non-carcass mass produced higher also. However, the significant level of non-carcass weight on male Peranakan Ettawa goat was 0.75, then the non-carcass weight result in this study had no significant effect with different local feeds, i.e., mulberry and Gamal feed.

The average non-carcass weight can be from by the distribution of non-carcass weight (skin, head, legs, liver, spleen, lungs, trachea, heart, testis, omental fat, tail) can be seen in Figure 2.

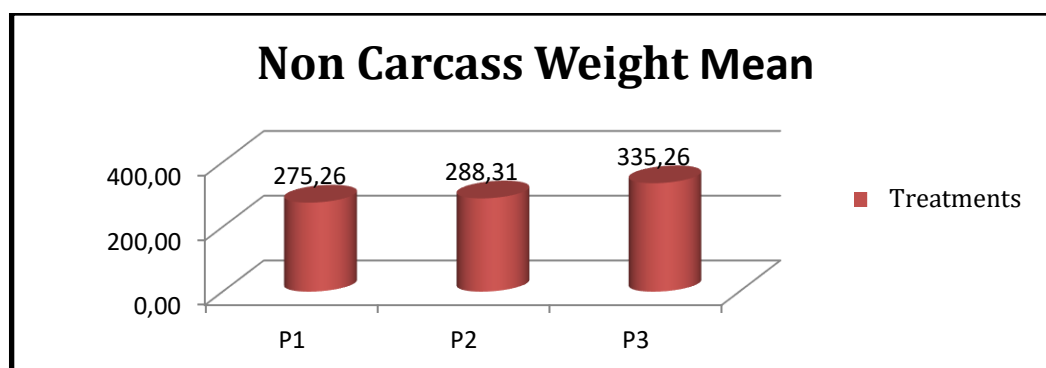


Figure 2. Mean of non-carcass weight on male Peranakan Ettawa goats.

From Figure 2, it can be seen that the average non-carcass weight of the highest male Peranakan Ettawa goat is P3 treatment with weight 335.26 gram for goat treatment of 100% Gamal. Meanwhile, the lowest percentage of non-carcass weight is 275.26 gram for goat treatment P1 with 100% mulberry feed.

Factors affecting non-carcass weight on male Peranakan Ettawa goat are different feed consumption with dry material feed. It is reinforced by the statement (Berg & Butterfield, 2005) that factors that may affect the non-carcass production of livestock are growth and nutrition.

### 3. Percentage of Non-Carcass

The highest rate of non-carcass weight was in P2 treatment. For more details can be seen in Figure 3.

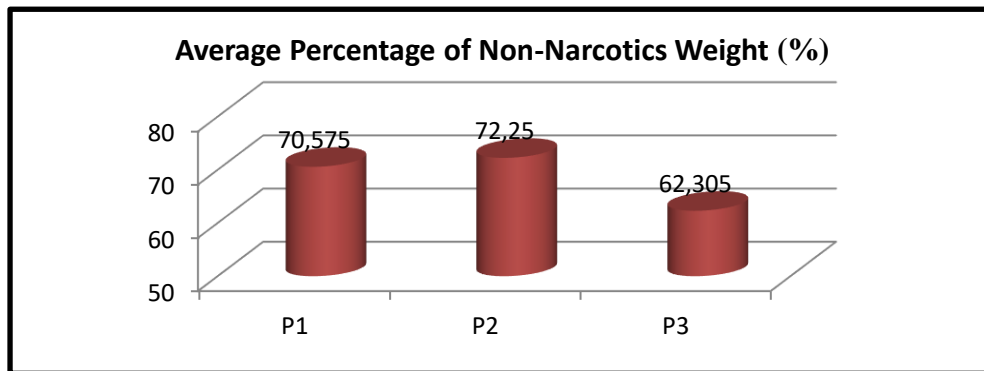


Figure 3. Average percentage of non- carcass weight on Male Peranakan Ettawa Goats.

Based on the result of research, the percentage of a carcass part of male Ettawa Peranakan with different feed showed significantly less than 5.14 (for  $P < .05$ ). It means that the rate of non-carcasses of male Peranakan Ettawa goats in all three treatments has an unstable ( $p < .05$ ) effect with different local feeds, i.e., 100% mulberry feed, 50% mulberry + 50% Gamal, and 100% Gamal. Non-carcass weight obtained is in line with the weight of the resulting cut, the higher the importance of reduction, then the non-carcass mass produced is also higher.

Hudallah, Lestari, & Purbowati (2007) and Hammond (2013) states that the more food substances consumed, the higher daily weight gain (DWG) so that the effect on the weight of the pieces obtained.

### 4. Non-Carcass Organ

Noncattle carcasses are the result of livestock cutting consisting of head, skin, internal organs, lower legs of the carpal joint and forefoot, tarsal bones or rear legs (Soeparno, Indratiningsih, Triatmojo, & Rihastuti 2006).

#### Skin

Percentage of carcass weight can be from a division of carcass weight (skin, head, feet, liver, spleen, lungs, trachea, heart, testis, omental fat, tail). The highest percentage of goat skin weights was 952.5 grams for P3 treatment goat with 100% Gamal feed. The lowest weight of goat skin was 695 grams for goat treatment P1 with 100% mulberry diet.

From the result of analysis of the diversity of treatment giving concentrate with different local feed give a real effect ( $p > .05$ ) to mean of skin weight. It is supported by Soeparno et al. (2006) statement that the treatment of nutrients and pastoral species in livestock affects the importance of the skin at the same weight. It means that different local feeding between mulberry and Gamal feeds may change skin weight in male *Peranakan Ettawa* goat.

#### Head

Based on the results of this study, the average non-carcass weight of goat Peranakan Ettawa male is the highest percentage of goat head weight is 1.145 gram for P3 goat treatment with 100% Gamal feed and the lowest rate of goat head is 1.050 gram for goat treatment P2 with feed 50% mulberry and 50% Gamal.

The result of diversity analysis of concentrate treatment that is different from local food did not give a real effect ( $p > .05$ ) to the weight of head which kept intensive. But in this study, the importance of the head was not significantly different because of the constrained

concentrate. It is by the opinion of Gailis & Mahgoub (2008) states that the type of feed does not affect the weight of the head and gastrointestinal fat.

### **Feet**

The highest weight of goat leg is 542,5gram for P3 treatment goat with 100% Gamal feed. The lowest weight of goat legs is 401.5 grams for goat treatment P1 consisting of the front and rear legs.

Different treatment of different natural feeding can have a significant effect ( $p > 0.05$ ) on foot weight. It is by the opinion Soeparno et al. (2006) which states that the nutritional treatment is having a different impact on the non-carcass weight externally, especially goat legs.

### **Liver**

The highest weight of goat liver was P3 with weight 312,5 g with 100% Gamal feed. The lowest percentage of goat liver weight was 206 g for goats treated P1 with 100% mulberry diet.

Treatment of concentrate that is different natural food give a real influence ( $p > .05$ ) to the weight of liver. It is caused by providing the same focus. By the opinion Soeparno et al. (2006) which states that the nutritional treatment influences internal non-carcass weight like the liver.

### **Limfa**

The highest goat lamb weight was 41 grams for a P2 treated goat with 50% mulberry and 50% Gamal. The lowest weight of goat lamb was 22 grams for P1 treatment goat with 100% mulberry diet.

The result of treatment of concentrate treatment that is different natural food did not give a real effect ( $p > .05$ ) to spleen weight. It is due to the nutrient content contained in each concentrate. While the opinion Soeparno et al. (2006) which states that the consumption of high nutrients will reduce the weight of the spleen.

### **Lung and Trachea**

The highest weight of goat lung and tracheal goats was 150 grams for a P3 treated goat with 100% Gamal feed. He lowest weight of lung and the tracheal goat was 130 grams for a P2 treated goat with 50% mulberry and 50% Gamal. The result of treatment of concentrate giving that is different natural food did not provide significant effect ( $p > .05$ ) to the lungs and trachea weight. The reason is a mixture of nutrients contained by mulberry and Gamal feed. Opinion Soeparno et al. (2006) states that the consumption of different nutrients will reduce the weight of lungs and trachea.

### **Liver and Fat**

The highest mean weight of heart and goat fat was 87.5 grams for P3 treated goat on 100% Gamal feed. While the lowest weight of heart and goat fat is 62.5 grams for goat treatment P1 with 100% mulberry diet

The results of concentrate treatment analysis that is a different local feed of mulberry and Gamal give a real effect ( $p > .05$ ) to the weight of heart and fat. It is due to the nutrient content contained in each concentrate is the same. It is by the opinion Soeparno et al. (2006) which states that the nutritional treatment affects the non-carcass weight internal like a heart.

### **Testes**

The highest mean genitals weight of goats was 77.5 grams for a P1 treated goat with 100% mulberry diet. The lowest weight of goat genitals was P3 for P3 treatment goat with 100% Gamal feed. The result of mulberry concentration and Gamal concentrate treatment did not give significant effect ( $p > .05$ ) to test weight. The is due to the administration of three different concentrates. Susilawati, Suyadi, Nuryadi, Isnaini, & Wahyuningsih (1993) states that the importance of a testis is affected by age, type of livestock, and food conditions

### **Tail**

The highest weight of goat tail was 55 g for a P3 treated goat with 100% Gamal feed. The lowest weight of goat tail was 28.5 g for goat treatment P1 with 100% mulberry diet. Different feeding concentrates of mulberry and Gamal gave a significant effect ( $p > .05$ ) on the percentage of tail weight. It is due to the nutrient content contained in each concentrate is the same. It is by the opinion of Soeparno et al. (2006) which states that the nutritional treatment affects the non-carcass weight on the Peranakan Ettawa goat tail.

### **Gastric Weight, Oesophagus, and Contents of Abdomen**

The average weight of Gastric + Oesophagus + highest goat content was 2932.5 g for P3 treated goat with 100% Gamal feed. While the lowest weight of goat tail was 2351,5 g for goats managed P1 with 100% mulberry feed.

The result of the analysis of feed concentrate treatment was different between mulberry and Gamal feed gave a real effect ( $p < .05$ ) to gastrointestinal weights, i.e., stomach and esophagus. It is by the opinion Soeparno et al. (2006) which states that the nutritional treatment affects the stomach, throat, and contents.

### **Gut**

The highest intestine weight on goats was 1.824 grams for treatment of P3 goat with 100% Gamal feed. The lowest intestine rate is 1.559.5 grams for therapy on goat P1 with 100% mulberry diet.

The result of feed treatment concentration analysis was different between mulberry and Gamal feed gave a real effect ( $p > .05$ ) to the percentage of intestinal gastrointestinal weight. It is due to the nutrient content contained in each concentrate is the same. It is in the opinion of Basuki (2000) which states that the rate of growth of internal organs between one with another is different and also influenced by nutrients.

### **D. Conclusion**

Based on the results and discussion it can be concluded that different feeding at 100% level in this study has no significant effect ( $p > .05$ ) on increasing percentage non-carcass of male Peranakan Ettawa goat. It means that each type of feed consumed no considerable impact on the percentage of non-carcass in male Peranakan Ettawa goats.

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## **Effect of Bulls on Birth Rate and Birth Weight by Using Semi-Intensive Bali Cattle Maintenance**

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### **ARTICLE INFO**

e-ISSN: 2548-3803  
p-ISSN: 2548-5504  
Vol. 3, No.1, June 2018  
URL: <http://dx.doi.org/10.31327/chalaza.v3i1.539>

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### **Abstract**

This study was to know the effect of the Bull on conception rate and birth weight of Bali cattle raised with semi-intensively. This study uses an entirely randomized design (CRD) with four treatments with unbalance data. The survey conducted during a three months period of December 2012 to February 2013, at the Laboratory of beef cattle Production, Faculty of Animal Science, Hasanuddin University, Makassar. Materials of the study were as four bulls of dams Bali cattle with age from 2.5 to 4 years, 12 Bali cows, and 55 calves born from 2005 through 2012. The animals house throughout the year and they were exercise and grazing, approximately 4 hours in the daytime until afternoon. In the house, the animals were fed using elephant grass, additional feed (rice brian), salt, and water ad libitum. The results of this study showed that conception rate and calving rate of Bali cattle raised semi-intensive were 95.62% and 86.25% respectively. The average birth weight was 13,06 kg. It can be concluded that the conception rate and birth weight is affected by them ales, while the calving rate no significant effect of Bull.

**Keywords:** Bali cattle, bull, conception rate, birth weight

### **A. Introduction**

Bali cattle is the original broiler of Indonesia and is the domestication of Banteng (*Bos-bibosbanteng*) (Hardjosubroto, 1994), and first island cattle (Sutan, 1988). Bali beef cattle are excellent for beef cattle in Indonesia, because of their high reproductive capacity, and using as working animals in paddy fields and fields (Putu, Situmorang, Lubis, Chaniago, Triwulaningsih, Sugiarti, Mathius, & Sudaryanto, 1998), high carcass percentage, lean meats, high positive heterosis on crosses (Pane, 1990). High adaptability to the environment and the rate of births can reach 80 percent (Tanari, 2001).

Entering the year 2000 the number of cattle population reached 718,164 tails, in 2001 to 722,452 tails and the next year tends to decline, as in 2006 to 637,128 tails. Factors contributing to the above decline have seen in the study of cut-rate data, the rate of cattle expenditure, the price of income and birth rate in 2005. The reduction of beef cattle during the period of 2002 - 2006 was 2.63% per year, this is allegedly due to: a) unbalanced between meat production and

demand, b) the high number of productive female slaughterhouses and community awareness/breeders will minimize prolific female slaughter is still low, c) low birth rate and calf harvest, e). The level of cattle expenditures for inter-island trade purposes is not controlled, especially the broiler inter-island illegal,). Loss of population buffer areas included in the territory of West Sulawesi and 6). No programmed nursery (Sonjaya, 2012).

Bull is a thing to be considered to increase population and productivity in beef/broiler farms. The male will marry the parent resulting in conception and produce a new calf. Birth weight is also inseparable from the influence of bull where only certain males who can deliver high birth weight. These were the basis of research on the impact of bulls on conception rates and keep birth weight in Bali cattle at Hasanuddin University Cut Laboratory livestock.

The decline in livestock productivity is thought to be caused by conception rates and lower birth rate (birth weight). The influence of males is one of the factors that influence marriage so that the occurrence of conception, birth and high birth weight of calf. Therefore, it is necessary to assess how far the influence of males on conception rate and birth weight of Balinese cow-calf

## B. Methodology

### 1. The Material

The material of this research is using Bali cattle which consist of: 4 male tail, 12 head of mother and 55 calves kept at Cattle Laboratory, Faculty of Animal Husbandry, Hasanuddin University, Makassar, Data collected starting from 2005 - 2012 from note and observation directly.

### 2. Livestock Maintenance

The management of Bali cattle at the Cattle Laboratory is semi-intensive maintenance that combines ranching and shepherding. The marriage system is done naturally (using a stud). Table 1 Showed the distribution of male usage.

### 3. Research Procedures

This research used by processing the data obtained from Livestock Breeding Laboratory of Husbandry Faculty, Hasanuddin University, Makassar. Based on the records obtained from parent conception data, birth, and childbirth weight, from each male each year. The bulls used were four from 2006 to 2012 (Table 1).

**Table1. Distribution of using bulls and number of cows by Year of Birth.**

| Bull | Year of birth |      |      |      |      |      |      |
|------|---------------|------|------|------|------|------|------|
|      | 2006          | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| P1   | 6             |      |      |      |      |      |      |
| P2   |               | 7    | 9    |      |      |      |      |
| P3   |               |      |      | 8    | 9    | 11   |      |
| P4   |               |      |      |      |      |      | 13   |

### 4. Parameter of Research

The parameters observed in this study were:

#### a) Rate of Conception

The Conception rate is the number of pregnant cattle in one year. The indicator for measuring conception rates that are often used is the number of broodstocks in 1 year divided by the number of females in productive.

#### b) Rate of Birth

The birth rate or crude birth rate (CBR) is the average number of livestock born in each year. The birth rate is calculated by the formula  $CBR = N / R \times 100\%$ , N is the number of births in that year and R is the number of pregnant female mothers in the population.

#### c) Weigh of Birth

Birth weight is the result of weighing of the new calf. Birth weight is obtained by considering calves no later than one day (24 hours) after birth.

### 5. Data Analysis

The data obtained were analyzed using Randomized Complete Randomized Design (RAL) with four different treatments and replications. If the treatment has a significant effect, then further test is done to distinguish the effect of treatment. The data analysis by using the following formula (Gasperz, 1991):

$$Y_{ijk} = \mu + \alpha_i + \epsilon_{ij}$$

Explanation:

$Y_{ijk}$  : The observations for the i-th bull factor and the j<sup>th</sup> replication.

$\mu$  : Common middle value.

$\alpha_i$  : Influence of i<sup>th</sup> bull factor (i =1, 2, 3, 4).

$\epsilon_{ij}$  : Random effects (experimental error) at the i-th stage (bull factor) and on j-th repeat (j =1,2, 3, ... n).

In this analysis the data on conception rate, birth and death were analyzed based on descriptive and Chi-square analysis. The data analysis by using the following formula (Gasperz, 1991):

The formula of Chi-Square:

$$X^2 = \sum (\frac{fo - fh}{fh})^2 fh$$

Explanation:  $X^2$  =Chi Square;  
fo =frequency observed  
fh =expected frequency

## C. Result and Discussion

### 1. Rate of Conception

The conception rate of Bali cattle from 2006 to 2012 based on males from 2006 to 2012 at the Livestock Breeding Laboratory of Hasanuddin University Faculty of Animal Husbandry (Table 2.)

**Table 2. Rates of conception, birth rate, and average birth weight of Balinese cow-calf based on different Bulls.**

| Bulls (P)      | N  | Conception Rate | Birth Rate   | Average of Birth Weight   |
|----------------|----|-----------------|--------------|---------------------------|
|                |    | %               | %            | %                         |
| P1             | 6  | 100             | 66,66        | 12,5 ± 1,3 <sup>bc</sup>  |
| P2             | 16 | 93.75           | 86,67        | 11,92 ± 1,3 <sup>c</sup>  |
| P3             | 28 | 96.43           | 100          | 14,37 ± 1,4 <sup>a</sup>  |
| P4             | 13 | 92,31           | 91,67        | 14,23 ± 2,1 <sup>ab</sup> |
| <b>Average</b> |    | <b>95,62</b>    | <b>86,25</b> | <b>13,06 ± 1,8</b>        |

Explanation: Different superscripts on the same column show very significant differences (P <.01), P1= First bull, P2=Second bull, P3= Third bull, and P4 = fourth bull.

Based on Table 2, it shows that the percentage of conception rates of mothers from different males. At P1 is the highest parent conception rate reaching 100%, this is because all parent mated with P1 is pregnant. Although all pregnant women but the lowest average birth rate of 66.66%, this is caused by the abortus parent (miscarriage). While for the lowest conception rate is P4 is 92% and birth rate 91.66%, this is caused by some parent mated with P4, not all conception and pregnant parent occurs abortus (miscarriage), so that design and birth rate does not reach 100 %. Although The conception rate of P2 is higher than conception rate of P4, the birth rate is lower. While at P3, conception rate 96.43% but birth rate reach 100% because all concept cows give birth

Based on the percentage of conception rates in Table 2, known that there are three groups of males whose conception percentage is less than 100%. The low conception rate of mothers

coupled with P2 and P4 compared to other mothers was due to a non-pregnant parent that year, and the newborn was pregnant the following year due to repeated mating. The average conception rate obtained in the study is 95.55%.

Repeat breeding is a female cow that has regular cycles and periods of marriage that have been rated 2 or more times with a fertile male or inseminated with fertilized fertile cement but still not pregnant. Factors of failure of fertilization are the main factors causing repeated cow mating. Although the failure of fertilization occurs in female animals, the causal factors also occur in male animals or can be caused due to management factors that are less good.

Based on the results of Chi-square analysis ( $X^2_{count} < X^2_{\alpha} = .05 = .96 < 9.49$ ), showed that the bulls had a significant effect on the conception rate. The point means that cows are related to conception rates. The end is because the males are in a genetic factor that intimately affects the marriage to produce offspring as well as male fertility, marital management, feed availability, and maintenance management that have more influence on conception rates. It is by the opinion of Jakob (1994) which states that the conception rate on the control of beef cattle population depends on the fertility of male and female beef cattle as well as the quality of marital management. It is corroborated by Salisbury & Vandenmark (1985) that the influence of males on the fertility of female cows and bulls is difficult to know because the factors are so complex and numerous. Environmental factors such as seasons each year, factor management and dietary factors affect more cows than males. Susilawati, Srianto, Hermanto, & Yuliani (2003) stated that males aged 2 to 7 years could produce the best cement with high conception rates in females who are married compared to males aged beyond that interval.

## 2. Rate of Birth

Based on Table 2. it can be seen that birth rates from mains mated to P1, P2, and P4 do not reach 100%. The point is due to P1 and P4 there are several parent abortus (miscarriage) due to male genetic differences. Based on the results of Chi-square analysis ( $X^2_{count} > X^2_{\alpha} = 0.05 = 12.63 > 9.49$ ), indicates that the influence of the male has no significant effect on the birth rate. The point means that research on birth rates is more influenced by environmental and genetic factors, although male influences are few but still play a role in birth. Early embryonic mortality in female cows is often due to inbreeding marriage or marriage of a bitch or a thousand so that the ugly traits of both male and female parent will appear more frequently in its derivatives (Hardjopranojoto, 1995). Embryonic mortality indicates mortality from ovum and fertile embryos to the end of implantation (Hafez, 1993).

The mean birth rate obtained in this study was 86.25%. This birth rate includes a high birth rate when compared to previous Bali cattle-birth studies. Wahyuni (2000) stated that Bali cattle birth rate reached 83.4%. Darmaja (1980) study, which obtains an average birth rate of 81.87% of Bali cattle for first, second and third births in areas with paddy-rice, paddy-rice, and crops planted.

## 3. Birth Weight of Bali's calf

Birth weight is an essential factor in the growth of cow-calf. Cows with massive birth weight and normal birth will be better able to maintain their life. Based on the analysis of variance, showed that the males had a very significant effect on calf birth weight ( $P < 0.01$ ). As stated by Karnaen & Arifin (2010), which indicates that the birth period shows the impact on calf birth weight (calf) in other words the birth weight between one birth period with another is significantly different.

From Table 2, we can see the mean birth weight of different males namely P1, P2, P3, and P4 are respectively 12.5, 11.92, 14.37, and 14.23 kg. The point shows that an excellent stud or superior will produce good offspring as well. While the average birth weight obtained is 13.06 kg. This figure is higher than the study of Sumbung, Batosama, Ronda, & Garantjang (1978), the results of research conducted from 1975 - 1977 on the campus of Ujung Pandang Hasanuddin University, the average birth weight of cows Bali  $12.6 \pm 2.6$  kg. Sutan (1988) said that some things have a relationship and affect birth weight, among others, the mother nation (female/male), gender of the child, duration of a pregnant mother, age or parity of mother and mother food during conception. Also, the high average birth weight obtained due to improved management and feed.

#### D. Conclusion

The results of the study concluded that males in semi-intensive care systems strongly influence the parent's conception rate and calf birth weight.

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## **The Local Chicken Breeders Levels Knowledge of the Implementation of Newcastle Disease Vaccination in Ulu Mowewe, Indonesia**

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### ARTICLE INFO

e-ISSN: 2548-3803

p-ISSN: 2548-5504

Vol. 3, No.1, June 2018

URL: <http://dx.doi.org/10.31327/chalaza.v3i1.558>

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### **Abstract**

This research aims to determine the level of knowledge in domestic poultry vaccination Newcastle Disease (ND) in the village of Ulu Mowewe, Mowewe District of Kolaka Regency, Indonesia. There are two variables includes namely the primary variable and the supporting variable. The identity of respondents consisted of the respondents' age, education level, some innocent families, land area, and experience in breeding are the supporting variables. The primary variable is the knowledge level in implementing ND vaccination. Doing tabulation data Qualitatively and percentage. Based on the results, known that the breeder chicken in the village of Ulu Mowewe included in the category as experienced breeding regarding experience working farm free-range chicken. In another hand, the breeders chicken in the town is skilled yet in vaccinating Newcastle Disease. From 20 respondents, there is only one skilled person who has ability to vaccinate the ND. Therefore, it is essential to train the breeders at the village.

**Keyword:** local chicken, vaccination, level of knowledge, Newcastle disease vaccination.

### **A. Introduction**

The government's efforts to increase agricultural production, particularly the livestock sub-sector, continue to be encouraged, in line with rising population growth, as well as increasing community needs. It is necessary and closely related to the need for animal protein, creating new jobs and income and living standards of farmers.

Local chicken is one type of poultry that has popularized and spread throughout the archipelago. For the people of Indonesia, chicken is not a foreign matter. The term "Local Chicken" was originally the opposite of the term "broiler chicken," and this term refers to chickens found roaming freely around the housing. Nevertheless, since the development,

refining, and breeding program of some superior local chickens, is now known to some of the best local chicken. To distinguish it is known as local chicken for chicken that has been selected and maintained by improving the technique of cultivation (not just scrambled and left to feed themselves). Local chicken farms have a significant role in supporting the economy of rural communities because it has high adaptability to the environment and maintenance is relatively more comfortable (Rasyaf, 1989 and Anonymous, 1998).

The cultivation of local domestic chicken is very appropriate for the effort to nutrition improvement and increase in family income because the results are sustainable. The increased population and production need to go through intensive maintenance which focuses in operation on the implementation of vaccination Newcastle Disease (ND) in local chicken. Newcastle Disease (ND) is a disease of fatal poultry (deadly). The cause is an NDV virus attack, a single beam RNA virus with negative sequence antisense. Chicken attacks are the best known, with clinical symptoms such as getting a runny nose (runny and stuffy nose), snoring, wings going limp (droop), dragging feet, until the head drops or folds. In young poultry, this attack may soon end in death, whereas in adult poultry, death usually occurs two to three days after the first symptoms are seen (Anonymous, 1998).

The village of Ulu Mowewe is one of the towns in Mowewe sub-district, Kolaka Regency is one potential enough area for the development of local chicken. Based on the results of field observations, known that the population of local chicken in the village is as many as 325 heads with the number of household heads that keep the local chicken as much as 20 families. Based on the above, the authors researched the level of knowledge of *local* chicken farmers in the implementation of ND vaccination.

## **B. Methodology**

### *1. Types and Techniques of Data Collection*

The data collected in this study consists of two types of data, namely:

- a. Primary data, i.e., data obtained from field studies and direct interviews with local chicken breeders accompanied by a questionnaire.
- b. Secondary data, i.e., data obtained from relevant agencies and literature that support this research.

Data collection is from through observation and interview method. Observation method needs to do by observing the process of local chicken farm cattle in every population/breeders, while the interview is by providing questions to the population/breeders, accompanied by filling questionnaires.

### *2. Population and Sample Determination*

Population in this research is all breeder of local chicken in the village of Ulu Mowewe, Mowewe district Kolaka Regency. They consisted of 20 householders (breeder). In this research, the sampling technique used is saturated sampling technique, that is sampling technique when all population is used as a sample and also known as the census.

### *3. Variable Observed*

Variables to be studied in this research consist of:

- a. Supporting variable is the identity of respondent consist of age, education level, number of family dependent, land area, and farming experience.
- b. The primary variable is the level of knowledge in implementing Newcastle Disease vaccination (ND).

### *4. Data Analysis Method*

Data obtained from the results of this study will be tabulated then calculated on a percentage and analyzed qualitatively.

## **C. Result and Discussion**

### *1. Resident Identity*

Respondents' identity describes the condition of respondents who are considered to have an effect on the farmers in managing the livestock business activities they lead.

The respondent's identity is as follows:

- a) Age
- b) Education level
- c) Number of family dependents

- d) Breeding experience
- e) Extent of farmland
- f) Number of local chickens

#### a. Age

Age can affect one's activity both at work and in thinking. In general, healthy breeders and young people can think in managing their farming activities compared with old farmers. Soehardjo & Patong (1984) categorized the age range of labor based on productive and non-productive groups with the age range of 0-14 years including non-productive age, the age range of 15-54 years including fertile age and five years old categorized as less productive age.

From the result of research, found that age of the breeder (respondent) in the village of Ulu Mowewe from 20 respondents studied, the lowest is 25 years, and the highest is 59 years. Based on these data, then classified according to the division of productive age groups and less productive (Table 1).

**Table 1. Distribution of productivity and less productive age group of local chicken in the village of Ulu Mowewe**

| Age Group (Year)      | Frequency (Man) | Percentage (%) |
|-----------------------|-----------------|----------------|
| 25-54 (Productive)    | 18              | 90             |
| >55 (Less Productive) | 2               | 10             |
| <b>Total</b>          | <b>20</b>       | <b>100</b>     |

Source: Data Processed, 2013

The Table 1 shows that out of 20 respondents, most (90%) are in the productive age group of 25-54 years. The rest (10%) of respondents are in the age group less productive that is 69-75 years. Based on the age, it can be mean that the respondents in the village have the physical ability in managing their local chicken business activities in their productive period.

#### b. Level of education

The people education level can affect a person's mindset and speed up the process of receiving information. Relatively high education and accompanied by robust physical capabilities lead to more skilled and dynamic farmers in managing their farming activities. As table 2 below:

**Table 2. The formal education level of respondents in the village of Ulu Mowewe**

| No. | Education Level | Amount (Person) | Percentage(%) |
|-----|-----------------|-----------------|---------------|
| 1.  | SD/Equivalent   | 9               | 45            |
| 2.  | SMP/Equivalent  | 6               | 30            |
| 3.  | SMA/Equivalent  | 5               | 25            |
|     | <b>Total</b>    | <b>20</b>       | <b>100</b>    |

Source: Data Processed, 2013

The Table 2 shows that the level of formal education of poultry farmers in the village of Ulu Mowewe is still low, because of 20 respondents, only 5 are high school graduates, and 6 are junior high school graduates, while the majority are nine elementary school graduates. It means chicken breeders in the village have to give an additional skill, especially livestock business skill through non-formal education, or by counseling.

#### c. Number of Family Counts

Thohir (1983), that the number of dependents of families of 1-3 people is called the dependents of small families, 4-6 are called middle family dependents, and more than six people are called significant family dependents. The family dependents referred to in this study are all people who live inside or outside the home and become dependents of the head of the family.

Based on the results of the study obtained data that the dependents of local chicken breeder family in the village of Ulu Mowewe ranged from 2-7 souls (Table 3).

**Table 3. Number of Respondents family dependents**

| No.          | Family numbers (head) | Amount (Person) | Percentage (%) |
|--------------|-----------------------|-----------------|----------------|
| 1.           | 2-3                   | 4               | 20             |
| 2.           | 4-6                   | 13              | 65             |
| 3.           | 7                     | 3               | 12             |
| <b>Total</b> |                       | <b>20</b>       | <b>100</b>     |

Source: Data Processed, 2013

The Table 3 shows that the highest percentage of 60% of respondents has 4-6 family dependents. Based on the classification of the number of family dependents, it can be mean that the respondent has a dependent family. Based on the research results obtained data that the responsibility of respondent's family of farmers averages in the range of productive age. Thus, in the case of the fulfillment of labor needs in the local chicken livestock business, respondents have the asset of labor so that it can streamline the use of work because no longer need to use work from the outside who must spend.

#### d. Livestock area

The land is one natural factor that can have an essential position in agriculture and very determine the income of farmers from the results of his business. The size of the land will affect the farmers in making decisions related to farming activities that will do. According to Hernanto (1991), the area of agricultural land in Indonesia is divided into three groups based on the field of property, which is a narrow farming area ( $\leq 0.5$  Ha.), Medium area (0.6-2 ha) and vast farmland ( $\geq 2$  Ha.).

The area of land referred to in this study is the area of property owned by farmers and used for local chicken farming business. The results of the research show that the space of a local chicken farm owned by the farmers in Ulu Mowewe village ranges from .05 – 1 Ha. Table 4 shows as below.

**Table 4. Area of Livestock farm local chicken respondent in Ulu Mowewe village**

| No.          | Land Area (ha) | Frequency (Person) | Percentage (%) |
|--------------|----------------|--------------------|----------------|
| 1.           | $\leq 0.5$     | 18                 | 90             |
| 2.           | 0.6-2          | 2                  | 10             |
| <b>Total</b> |                | <b>20</b>          | <b>100</b>     |

Sources: Data Processed, 2013

Table 4 shows that 18 people (90%) have a small land area and have 2 (10%) of common land. It indicates that in the village of Ulu Mowewe there are no breeders who have extensive farmland.

#### e. Breeding experience

Farmers in running their livestock business always work based on what has been gained from experience. Experience for farmers is a process of the incidence experienced by farmers in livestock, so it can be influential in making decisions about various alternatives that exist.

The breeding experience becomes determination, and it was from the length of an active breeder carrying out livestock activities. A breeder who has recently run his livestock business activities is more likely to imitate or seek guidance from farmers who are considered most skilled and experienced in conducting the same livestock raising activities with his farm. Soehardjo & Patong (1984), stated that the experience of farming is becoming into three groups, namely a) 1-5 years of experience categorized sufficient expertise, b) experiences 6-10 years categorized old, and c) experience ten years and above classified more experienced. It was the same as statement of Syamsuddin (1988).

Based on the results obtained data on the experience of breeding local chicken breeders in the village of Ulu Mowewe is very diverse, where the experience of the lowest one year and experience the highest 30 years. Table 5 shows as below.

**Table 5. Livestock farming experience local chicken respondents in the village of Ulu Mowewe**

| No.           | Experience (Year) | Frequency (Person) | Percentage (%) |
|---------------|-------------------|--------------------|----------------|
| 1.            | 1-5               | 4                  | 20             |
| 2.            | 6-10              | 11                 | 55             |
| 3.            | >10               | 5                  | 25             |
| <b>Jumlah</b> |                   | <b>20</b>          | <b>100</b>     |

Source: Data Processed, 2013

The Table 5 shows that most 55 percent of farmers have breeding experience in the range of 6-10 years, 25 percent over ten years and 20 percent experienced 1-5 years, so it is mean that local chicken breeders in the village of Ulu Mowewe can include in the category as experienced.

#### f. Number of Local Chickens

The number of chickens owned by farmers is a significant factor in a livestock business. The amount in question is all the number of chickens owned by the respondent, can affect the level of income earned. Farmers who have local chicken livestock in large quantities will get more production than the few.

The results showed that the amount of ownership of local chicken of 20 respondents ranged between 10- 30 individuals with a total of 325 heads and - average number of 16 cattle/farmer. The chicken is critical to increasing marginality of a farmer (Sudrajat, 1998; Rasyaf, 1989; Badarsyah & Zamrowi, 1992; and Djanah, 1985).

#### 2. Level of Skills in Vaccinating Newcastle Disease

The skill in the ND vaccination is an important thing that must be owned by farmers in raising local chicken. Based on the results obtained data on the skill level of local chicken farmers in the village of Ulu Mowewe, in vaccinating ND as Table 6 below.

**Table 6. The Respondents' skills level in conducting vaccination Newcastle decided in the village of Ulu Mowewe**

| No.          | Skill        | Frequency (Person) | Percentage (%) |
|--------------|--------------|--------------------|----------------|
| 1.           | Skilled      | 1                  | 5              |
| 2.           | Less Skilled | 4                  | 20             |
| 3.           | Unskilled    | 15                 | 75             |
| <b>Total</b> |              | <b>20</b>          | <b>100</b>     |

Source: Data Processed, 2013

Table 6 shows that most 75 percent of farmers are not skilled in vaccinating Newcastle Disease, less experienced 20 percent, and only 5 percent of competent or 1 person. So, it is mean that local chicken in the village of Ulu Mowewe is not skilled in doing vaccination Newcastle Disease. So that, it is desperately needed training to local chicken farmers in the community of Ulu Mowewe Newcastle Disease vaccination of the parties responsible for the development of the skills of the farmers. It was the same statement of Nugroho (1981) that vaccinating is one of the ways to prevent Newcastle disease.

#### D. Conclusion

The result of research concludes that the level of farmers knowledge of local chicken in the implementation of vaccination Newcastle Disease in the village of Ulu Mowewe District of Mowewe Kolaka Regency. It gives data that the breeder, the domestic chicken in the village of Ulu Mowewe. It also includes experienced livestock regarding experience trying to farm local chicken, but in the case of Newcastle Disease vaccine, local breeder chicken in the village of Ulu Mowewe not yet skilled in Newcastle Disease vaccine, because of the 20 respondents, only one qualified person vaccinated Newcastle Disease.

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