

Identification and nutritive value of forages in grazing land consumed by Kuantan cattle in Benai District, Kuantan Singingi Regency

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Abstract. This study investigated the effects of egg storage duration prior to incubation on performances of Arab Chickens during the first week post-hatch. A total of 100 day-old-chicks were distributed among 20 experimental units, each representing a different egg storage duration before incubation (1, 4, 7, and 10 days) with five replicates. There were five birds of each replicate totaling 25 birds per treatment. The variables examined in this study included the growth performance of Arab Chickens during the first week post-hatch, specifically the initial body weight, final body weight, body weight gain, feed intake, water intake, feed conversion ratio, and water conversion ratio. The findings of the study revealed that egg storage duration prior to incubation did not significantly affect ($P>0.05$) feed intake, water intake, and water conversion ratio. Storing eggs for up to 4 days did not result in any adverse effects ($P>0.05$) on initial body weight, final body weight, body weight gain, and feed conversion ratio. However, eggs stored for 7 days or longer exhibited a significant reduction ($P<0.05$) in initial body weight, final body weight, and body weight gain. Additionally, a notable increase ($P<0.05$) in feed conversion ratio observed for eggs stored for 10 days. In conclusion, the hatching eggs of Arab Chickens can be safely stored for up to 4 days without any detrimental effect on their performance during the first week post-hatch.

1 Introduction

Kuantan Singingi Regency is one of the regions in Riau Province which has an indigenous livestock, namely Kuantan Cattle. This cattle is widely raised by the local community. Kuantan cattle have been designated in the Republic of Indonesia Ministry of Agriculture Decree Number 1052/Kpts/SR.120/10/2014 which states that Kuantan cattle are a wealth of genetic resources for local Indonesian livestock and have a lineage from Bos Indicus cattle [1].

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In general, the management of livestock in Kuantan Singingi Regency is based on traditional system, which is the extensive system where all cattle are in the grazing fields from morning to evening [2]. The grazing areas include land along the Kuantan river and open pastures where the type of forage is not known. Under this management system the productivity of cattle is relatively low.

Forages growing on the pasture land for livestock consists of a number of grass species (Gramineae), legumes (Leguminosae) and several types of trees with leaves that can be consumed by livestock such as jackfruit leaves, hibiscus leaves and *Leucaena* [3]. The forage are grouped into grasses, legumes and other plants. Grass is a type of weed plant that has small stems, many varieties, segmented stems, long narrow leaves, spike-shaped flowers and grain-shaped fruit [4]. Legumes are feed plants that have higher nutritional value, especially crude protein (CP) content compared to grass. Legume plants can provide additional protein because their leaves have a much higher protein content than grass. Legume leaves also provide essential minerals and vitamins for livestock growth [5].

Most of the forage growing in pastures are native grasses and a few legume plants [6]. The lack of legume plants in natural pastures results in low forage quality, especially during the dry season when legumes do not grow. During the dry season native grass becomes the only source of feed and its quality becomes very low. Other local forage problems include low productivity, nutritional content, and limited development [7], so it is necessary to optimize regional potential in providing sustainable forage throughout the year. To determine the availability of types and nutritional potential of forage in an area, an inventory is needed. Inventory is a recording activity to create a data list for an item. This is very important to build an information system for the development of ruminant livestock, especially Kuantan cattle. Base on this information system, efforts are being made to optimize the use of locally available feed ingredients so that they can meet the standard needs of livestock and can prevent the extinction or extinction of Kuantan cattle. This research aims to determine the type and nutritional content of forage consumed by Kuantan cattle in Benai District, Kuantan Singingi Regency.

2 Materials and Methods

This research was carried out in Benai District, Kuantan Singingi Regency where forage samples were taken. Analysis of sample for their nutritional contents was carried out at the Nutrition and Feed Technology Laboratory, Faculty of Agriculture and Animal Science, Universitas Islam Negeri Sultan Syarif Kasim Riau.

The research method was carried out by observing and analyzing forage with the following steps: 1) Kuantan cattle were followed as they graze on the pasture from the time the cattle was released until when the cattle was penned; 2) Observations were made on the types of forage selected by Kuantan cattle during grazing time; 3) About 300 g of fresh samples of all species of forages found were taken and later analysed for nutritional content 4) Forages selected and consumed by cattle were sampled and analysed for the nutritional contents.

The parameters observed were, 1) Kind of forage that Kuantan cattle grab and eat, 2) Nutrient content, namely: Dried Matter (DM), Crude Protein (CP), Crude Fiber (CF), Ether Extract (EE), Ash, and Nitrogen Free Extract (NFE).

3 Results and discussion

Results of field observations shown that there were several types of forage eaten by Kuantan cattle during grazing period, namely grass, legume and other plant. Kind of forage and name of forage shown in Table 1. There were grasses (n=7), legume (n=3) and other plant (n=12).

Table 1. Kind and name of forage that eaten by Kuantan cattle during grazing period time

No.	Kind of Forage	Name of Forage
1	Grass	<i>Paspalum conjugatum</i>
		<i>Eleusine Indica</i>
		<i>Chrysopogon aciculatus</i>
		<i>Kyllinga brevifolia</i>
		<i>Imperata cylindrica</i>
		<i>Leersia hexandra</i>
		<i>Brachiaria mutica</i>
2	Legume	<i>Gliricidia sepium</i>
		<i>Centrosema pubescens</i>
		<i>Arachis hypogaea L</i>
3	Other palnt	Banana leaves (<i>Musa paradisiaca</i>)
		Areca leaves (<i>Areca catechu L.</i>)
		Palm oil leaves (<i>Elaeis guineensis Jacq</i>)
		Sago leaves (<i>Metroxylon sagu</i>)
		Mango leaves (<i>Mangifera indica L</i>)
		Sweet potato leaves (<i>Ipomoea batatas</i>)
		Cassava leaves (<i>Manihot esculenta</i>)
		Sugarcane leaves (<i>Saccharum officinarum L</i>)
		Fern leaves (<i>Pteridophyta</i>)
		Jackfruit leaves (<i>Artocarpus heterophyllus L</i>)
		Cocoa leaves (<i>Theobroma cacao L</i>)
		Caesarweed leaves (<i>Urena Lobata</i>)

Observation results showed that grasses were the dominant species of forage eaten by Kuantan cattle during the grazing period. The composition of forages consumed by Kuantan cattle were relatively similar to the botanical composition of forage for cattle in Lembang West Java. The variety of forage consumed is known to affect livestock productivity, due to difference in nutritional value [8]

Composition of forage type shown in Figure 1. High compositions of forage were other plant (54,55%) followed by grass (31,82%) and legume (13,63%). The composition of forage eaten by Kuantan cattle during grazing time was less than ideal. This due to the portion of legume was only 13,63%. According to [9] the proportion of grass and legume in pasture should be 60%:40%. This condition causes Kuantan cattle to consume forage that is low in nutrient so that their productivity becomes low. The availability of legumes eaten by Kuantan cattle must be sufficient. Legumes is a forage source of protein.

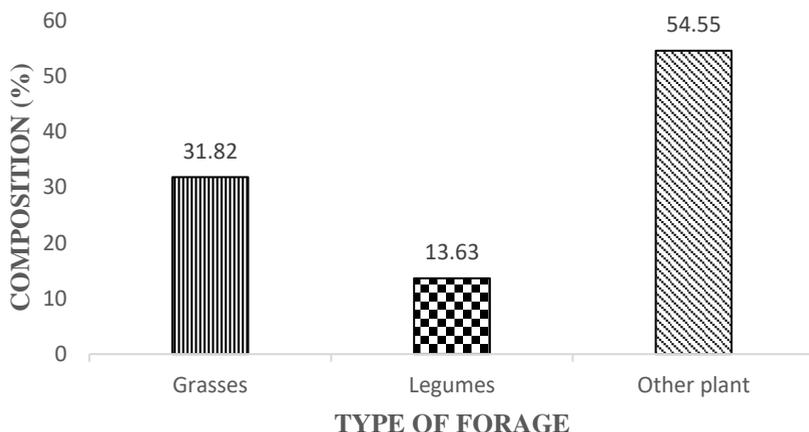


Fig. 1. Composition of forage types

The macro-nutrient content (DM, CP, EE, CF, ash and NFE) of grasses eaten by Kuantan cattle during grazing period is shown in Table 2. The value range of each nutrient were DM (62,56-94,26%), CP (4,33-11,07%), CF (21,78-33,66%), EE (1,49-2,00%), Ash (6,98-16,50%) and NFE (47,42-58,60%). The average CP content of grasses in this study was 9,08%. This CP value has exceeded the CP content of natural pasture grass which is only 3,99% [10], but still lower than CP content of field grass reported by [11] which range 9,22-13,56% on average 11,55%.

Table 2. Nutrient content of grasses that eaten by Kuantan cattle during grazing period time

Kind of Grass	Nutrient Content (%)					
	DM	CP	CF	EE	Ash	NFE
<i>Paspalum conjugatum</i>	24.40	10.94	24.51	1.50	12.97	50.08
<i>Eleusine indica</i>	23.56	11.07	23.53	1.99	7.95	55.46
<i>Chrysopogon aciculatus</i>	28.61	7.89	28.43	1.49	6.98	55.21
<i>Kyllinga brevifolia</i>	19.0k	9.96	21.78	2.00	7.67	58.60
<i>Imperata cylindrica</i>	40.77	4.33	33.66	1.98	6.98	53.04
<i>Leersia hexandra</i>	32.58	9.10	25.49	1.49	16.50	47.42
<i>Brachiaria mutica</i>	13.57	10.30	28.00	1.49	8.87	51.34

Macro nutrient contents of legume was eaten by Kuantan cattle during grazing period is shown in Table 3. The highest CP in *Gliricidia sepium* (22,24%) and lower in *Arachis hypogaea* (14,13%). The CP content of *Gliricidia sepium* eaten by Kuantan cattle during the grazing period was comparable to the CP content of *Gliricidia sepium* reported by [12], namely 22,6%. Although the CP content of *Gliricidia sepium* is high, the NFE content is low. The NFE content of *Gliricidia sepium* eaten by Kuantan cattle during the grazing period was slightly lower than the result of research reported by [13] of 39.50%. This differences is due to differences in climate and soil type. The CP content of *Arachis hypogaea* and *Centrosema pubescens* was relatively lower than legumes in general. This lead to the low quality of forage eaten by Kuantan cattle during the grazing period. Moreover, the proportion of legumes was only 13,53%.

Table 3. Nutrient content of légumes that eaten by Kuantan Cattle during grazing period time

Kind of other plant	Nutrient Content (%)					
	DM	CP	CF	FAT	ASH	NFE
Banana leaves (<i>Musa paradisiaca</i>)	21.99	9.27	24.00	5.45	9.18	52.10
Areca leaves (<i>Areca catechu</i> L)	26.21	12.96	25.00	3.00	8.80	50.24
Palm oil leaves (<i>Elaeis guineensis</i> Jacq)	40.51	7.35	22.55	2.48	12.15	55.47
Sago leaves (<i>Metroxylon sagu</i>)	46.08	7.80	26.73	0.50	7.78	57.18
Mango leaves (<i>Mangifera indica</i> L)	31.07	9.10	23.76	2.49	5.58	59.07
Sweet potato leaves (<i>Ipomoea batatas</i>)	38.37	22.76	14.85	1.99	12.59	47.80
Cassava leaves (<i>Manihot esculenta</i>)	26.68	17.77	16.00	6.50	10.54	49.19
Sugarcane leaves (<i>Saccharum officinarum</i> L)	29.94	7.28	27.45	2.00	23.13	40.13
Fern leaves (<i>Pteridophyta</i>)	14.48	14.48	16.67	1.99	12.92	53.95
Jackfruit leaves (<i>Artocarpus heterophyllus</i> L)	33.09	11.18	18.63	3.96	16.77	49.46
Cocoa leaves (<i>Theobroma cacao</i> L)	29.76	7.09	38.24	1.00	6.23	47.44
Caesarweed (<i>Urena Lobata</i>)	38.85	13.83	17.65	3.00	12.58	52.94

4 Conclusion

Based on result study there were 7 types of grasses, 3 Type of legumes and 12 several types of leaves that eaten by Kuantan cattle in Benai district during grazing period. Crude protein content and nitrogen free extract forage eaten by Kuantan cattle during grazing period range of 4,33-22,76% and 37,63-59,07%, respectively.

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