

# ANALYSIS ON HOLSTEIN COW MILK PRODUCTION MAINTAINED BY LARGE SCALE DAIRY FARM ON MIDDLE PLAIN IN WEST JAVA

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## Abstract

*In Indonesia the Holstein dairy cow is maintained by the large scale dairy farms on the middle lands. How far the empirical data of milk production of Holstein dairy cow in Indonesia is rare published. Based on the above description it is very interesting to perform the analysis of milk production of Holstein cow kept on the middle land in West Java. The research method was observationally conducted on milk production from the first until the sixth lactation period of Holstein dairy cow. The population samples from middle plain are 1248 heads of Holstein lactating cows maintained for three years. The milk production data are standardized to 305 2x ME. Based on the result and discussion it is found out that the range of real milk production is 1,068-9,696 l within 180-607 days lactation period with average lactation period 363.99±96.61 days, total milk production 3,761.14±1,458.34 l, and milk production 10.48±3.44 l/day. The Holstein milk yield of 305 days 2x ME is ranged in 1,088-8,313 l with average per lactation 4,136.60±1,518.01 l and average per head per day 20.37±17.76 l. It is suggested that to maintain the genetic potential of Holstein dairy cow the management and feeding must be considered.*

**Key words:** Milk, Production, Large scale, Middle plain, Holstein

## INTRODUCTION

Dairy cow milk production is the end result of a series of complex physiological processes incident and recurrent. Some kinds of genes interact and play a role in determining production. In addition to genetic or internal, environmental or external factor influences on milk production of dairy cows. Environmental factors consist of elements of feed, management, and climate. That dairy cow breed kept in Indonesia is the Holstein Friesian (HF) or it is sometime just called Holstein and Holstein grade.

Climate directly and indirectly effects on livestock production. Climate has several components, such as temperature, rainfall, and humidity. Climate affects the state of the local vegetation. Dairy cows that produce milk to consume vegetation in accordance with the given circumstances. Thus, the influence of climate on dairy cow in this case indirectly. Dairy cows produce optimal if kept in place

with an appropriate temperature. High or low temperature affects the physiological state of cows that can decrease milk production. Thus, the temperature effects direct impact on milk production of dairy cows.

Other climate component is rainfall. Within a year of rainfall in Indonesia is divided into two so that there is a months of the year dry and wet. Climate is closely related to the place or location of an area Rainfall affects the quality and quantity of grass production. Production quality grass is visible on the water content and nutrients. The quantity of grass production can be seen on the total weight of the grass produced. Usually the temperature plateau is suitable for maintaining dairy cows. On the other hand, breeders usually provide rations for dairy cows both the quality and quantity relatively does not change from time to time.

In Indonesia the dairy cows are maintained by the large scale dairy farms on the high and middle lands and some more of them on the low lands. The climate directly or not has an effect in milk production. It is known that there is a tendency a calf kept in a cold environment consumes more feed than calf

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maintained in a hot environment and furthermore the feed consumption affects the difference in milk production. This is the right time to publish the latest empirical data. The data could be referred for other researchers.

Based on the above description it is very interesting to perform the analysis of milk production of the Holstein cow that is kept by the large scale dairy farm on the middle land in West Java.

**EXPERIMENTAL PROCEDURE**

The research was the survey and used the technique of purposive sampling method. The research method was observationally conducted from the first to sixth lactation period of Holstein cows. The data used are from the large scale dairy farm. The variable observed is the milk production. The data collected are descriptively analyzed and compared to the references.

The data collected are then selected and need to have the complete data on first to sixth lactation period. And so, the data are tabulated for each research location. The data are from 1248 cows maintained for three years. The milk production data are standardized to 305 2x ME.

**RESULTS AND DISCUSSIONS**

**1. Results**

**Real Milk Production**

The research shows the real Holstein milk yield on middle plain in West Java as showed in Table 1.

Table 1 Real Holstein Milk Yield Maintained in West Java on Middle Plain at Large Scale Dairy Farm

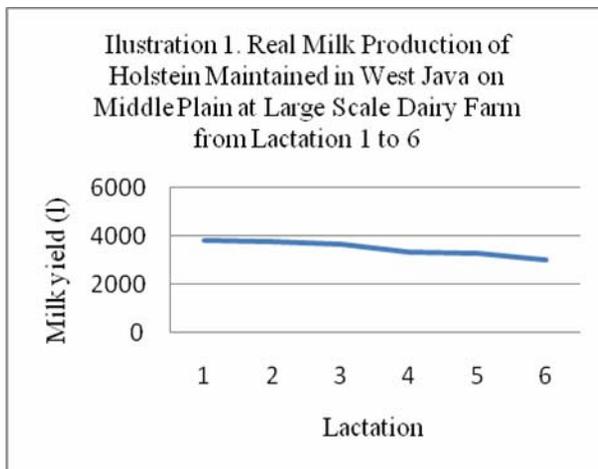
Lactation period	Milk production	
	Range	Average
1 <sup>st</sup>	1,921-9,696	3,815.15± 1,571.17
2 <sup>nd</sup>	1,068-8,420	3,786.20± 1,582.21
3 <sup>rd</sup>	1,180-9,531	3,678.50± 1,580.39
4 <sup>th</sup>	1,160-8,649	3,325.85± 1,469.10
5 <sup>th</sup>	1,237-6,859	3,286.90± 1,553.815
6 <sup>th</sup>	1,090-5,317	3,017.69± 1,569.89

The real Holstein milk yield correlated with length of lactation period can be seen in Table 2.

Table 2 The Length of Lactation Period and Real Holstein Milk Yield Maintained in West Java on Middle Plain at Large Scale Dairy Farm

Production	Length of lactation period days	Total milk production	Milk production
Range	180-607	1,068-9,696	-- l/h/d --
Average	363.99± 96.61	3,761.14± 1,458.34	10.48± 3.44

Furthermore the real dairy cow milk production from Table 1 is illustrated as shown in Illustration 1.



**Milk Production of 305 days 2x ME**

The real milk production is standardized to 305 2x ME and shown in Table 3.

Table 3 Holstein Milk Yield of 305 2x ME Maintained in West Java on Middle Plain at Large Scale Dairy Farm

Lactation period	Milk production	
	Range	Average
1 <sup>st</sup>	1,133-6,194	3,197.96± 1,174.15
2 <sup>nd</sup>	1,256-6,423	3,223.14± 1,123.87
3 <sup>rd</sup>	1,516-5,680	3,454.66± 989.19
4 <sup>th</sup>	1,088-6,859	3,511.15± 1,061.37
5 <sup>th</sup>	1,629-8,313	3,373.02± 1,501.24
6 <sup>th</sup>	1,090-6,847	3,281.82± 1,246.81

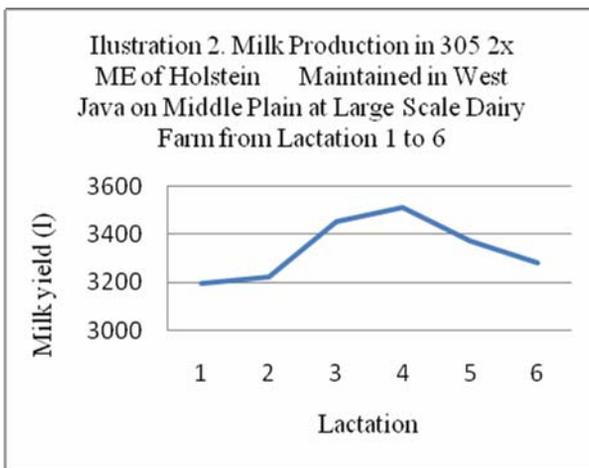
The range and average milk production in standardization of 305 2x ME is figured as seen in Table 4.

Table 4 Holstein Milk Yield of 305 2x ME Maintained in West Java on Middle Plain at Large Scale Dairy Farm

Milk production	Range	Average per lactation	Average per head per day
	--   --	--   --	--   --
305 2x ME	1,088-8,313	4,136.60± 1,518.01	20.37± 17.76

Table 4 above shows that it is a long lactation period and widely varied. This situation depends on the ability of milk production and milking time.

The milk production of 305 2x ME standardization from Table 3 is shown in Illustration 2.



The milk production reached its peak at the 4<sup>th</sup> lactation and then declined.

**DISCUSSION**

The Holstein cows maintained by the large scale farm to produce the milk had a widely different range of milk production. This situation can be seen on Table 1. Table 1 also appears that the milk production declined from first to sixth lactation. There were a small number of cows that had a high ability to produce milk. This situation is caused by different genetic ability and inability to maintain milk production.

The inability of milk production maintaining is largely due to the genetic and environmental factors that affect the physiological processes of animals is shown in the form of decreased feed consumption, water consumption, respiration and body temperature increases a hot environment followed by a decrease in milk production [1]. Environmental differences, in particular micro-climate conditions can vary in each region because there are differences in altitude (Payne, 1970). An unsuitable micro-climate conditions are to act as an inhibiting factor to

the normalcy of the process of animal physiology and furthermore it will suppress the ability of cattle to produce normally [5; 16].

According to Wijono et al., (1979), altitude factor and breed have a role on production, while the interaction between breed and altitude has no effect. The optimal milk production in lactating dairy cows occurs in the temperature range from -1 to 25° C, and will be a decline in milk production when cattle are kept above 27° C and high humidity conditions [2]. Turk (1978) stated that dairy cows that developed in the tropics have a lower milk production compared with temperate regions. This situation is consistent with the results of Istanto (2009) research. Istanto researching in East Java found reported that the milk production of small-scale dairy farms was influenced by the feeding and management of maintenance as well.

Table 2 above shows the range at 180-607 days of lactation and total milk production from 126.50 to 9696.00 l/lactation. The cow with low milk production and short length of lactation was culled or dead. On the other hand, the cow appeared a long period of lactation because it still produced a high quantity of milk. The average length of lactation  $363.99 \pm 96.61$  days with a total production of milk  $3,761.14 \pm 1,458.34$  l per lactation and the average production of  $10:48 \pm 3:44$  l/head/day. In this case the total milk production is determined by the ability of genetic and duration of lactation. Long lactation is part of the management. According to Istanto (2009), maintenance management and altitude effect on milk production. Rusdiana dan Sejati (2009) [8] reported, dairy cow milk production in Indonesia is 15 l/day and a good Holstein cow can produce 30 l milk per day in 305 days lactation. According to Pariatmoko [6] the range of dairy cattle milk production is 6-10 l/h/d in 2006 and the number is constant until 2009. He explained also that the milk production could be increased to 15-20 l/h/d if the cattle growth was good. Widayati (1999) reported that the cow in Sruni village produced milk average 8.15 l/h/day. According to Tappa (1999), dairy farm business and milk production can be

increased through the genetic, feeding system, and health development. Hartutik (2011) stated, the feed is very influential on milk production and milk production of dairy cows in East Java varies between 6-10 l/head/day. Rosdiana (2010) stated that the milk production is below 15 l/day nowadays and a good producer can produce 30 l/day. According to Sumardi (2011), a dairy cow production is affected by the genetic and its supporting factor.

## CONCLUSION AND SUGGESTION

### 1. Conclusion

Based on the result and discussion it is found out that there is a range of real milk production is 1,068-9,696 l within 180-607 days lactation period with average lactation period  $363.99 \pm 96.61$  days, total milk production  $3,761.14 \pm 1,458.34$  l, and milk production  $10.48 \pm 3.44$  l/h/d. The Holstein milk yield of 305 days 2x ME is ranged in 1,088-8,313 l with average per lactation  $4,136.60 \pm 1,518.01$  l and average per head per day  $20.37 \pm 17.76$  l. The Holstein cow milk production maintained by the large scale dairy farm on middle plain in West Java is above the average and categorized high.

### 2. Suggestion

The research gives a recommendation that to maintain the genetic potential of Holstein dairy cow the management and feeding must be considered.

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