Estimate the Milk Production of Friesian Holstein (Fh) Based on Incomplete Record in Balai Besar Pembibitan Ternak Unggul-Hijauan Pakan Ternak (Bbptu-Hpt) Baturraden, Banyumas, Central Java

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ABSTRACT

This study aimed to estimate the milk production of Friesian Holstein based on incomplete record in Balai Besar Pembibitan Ternak Unggul – Hijauan Pakan Ternak (BBPTU-HPT) Baturraden, Banyumas, Central Java. The material used was secondary data of milk production records in 2014 and 2015 of 95 dairy cattles in BBPTU-HPT Baturraden. Estimated milk production based on incomplete record method used milk production data every 15th day of each month of lactation. The analysis used for the calculation of milk production on the basis of complete records and incomplete records that use the compare means t-test. The result of the calculation of the estimated average milk production FH in BBPTU-HPT Baturraden used the complete records and incomplete record is not significant, so the calculation of the milk production based on incomplete record on the 15th day of each month during lactation may be used as an alternative in the milk production record method with a percentage error of -1.34%. Milk production of FH dairy cattle in BBPTU-HPT Baturraden are above standard milk production of FH dairy cattle in Indonesia.

Keywords: Dairy Cattle, Friesian Holstein, Milk Production, Incomplete Record

INTRODUCTION

The existing conditions of the dairy farmers in Indonesia a 95% is traditional farmers and the rest is commercial dairy farm. Dairy cattle, particularly dairy cows need to be developed because dairy cows produce milk that is one source of animal protein which has high nutrition. The famous dairy airy cows that to be developed in Indonesia at this time, namely was Friesian Holstein (FH) which originating from subtropical regions. Balai Pengembangan Perbibitan Ternak Unggul (BPPTU) Batturanden is one of the implementing Technical Unit (UPT) scope of the Directorate General of livestock and animal health which has the duty of carrying out maintenance, breeding, production, development, distribution and marketing of dairy breeds and the distribution of animal feed. It become one of dairy commodities that already applying modern milking system.

In addition, BBPTU-HPT Baturraden also do record activity including milk production, so the data can be used as material for the evaluation. Based on the data record of milk production at HPT-BBPTU Baturraden can be used as a basis for estimation of milk production based on incomplete records. If the calculation method is successful, it can be applied to the dairy farm which still has limitations in performing a recording milk production. The purpose of this research is to estimate the milk production of dairy cattle based on incomplete data in BBPTU-HPT Baturraden, Banyumas, Central Java.

MATERIALS AND METHODS

Material

This research was carried out using secondary data of milk production of BBPTU-HPT Batturaden. The material used, namely milk production record of 95 FH cows (2014 and 2015) in BBPTU-HPT Baturraden, Banyumas, Central Java, and the tools that used for data analysis. FH cow criteria used in the study has a long lactation of 7 months to 14 months.

Methods

Standarization. Standardization that used in this research was correction factors based on milk production adjusted to 305 milking days old direction, age of dam, and milking 2 times/day. Standardization for long lactation is 305 days based calculations that a dairy cow is optimal when it can be beared once a year, with long drying of 6 to 8 weeks. Adulthood is reached at the age of 66 to 72 months and at this age a cow is expected to have reached its optimal production. Correction factors used famously as mature equivalent (ME) or equivalent adult (Hardjosubroto, 1994). The calculation of the standardized milk production done by multiplying the milk production with each correction factors.

Data analysis. The estimation of the milk production using production data each 15th day of the month of lactation in each month. How to read the data record were taken only once in a month was with the prediction, because the records do not every day but once in a month then it should be done a prediction base on the available record, as follows:

$$Y = \Sigma h_i p_i$$

Where Y is taksiran produksi , i is the number of data n 1, 2, 3, h is the number of days record p is the production of milk in one day of recording (Hardjosubroto, 1994)

The analysis that used for the calculation of milk production base on the complete records and the incomplete records using the t-test. The percentage of error in calculation result prediction for milk production is presented in appendix 3, with the following formula:

$$P_p = \textbf{Error! Reference source not found.}$$

Where, P_p is the error percentage, P_L is the milk production base on the complete records (kg) P_{TL} is the milk production base on the incomplete records (kg) (Hardjosubroto, 1994).

The percentage error is positive (+), it means that the results of the estimation based on milk production which its done every 15th day of the month of lactation is larger than milk production based on a complete record. If the error percentage is negative (-), it means that the milk production results base on the incomplete records is smaller than the real milk production (based on the incomplete records).

RESULTS AND DISCUSSION

Milk Production

Milk production is one of the most important priorities in the dairy business. Milk production dairy cows are generally measured at one time during the lactation period of 305 days and required the data record to describe the production capability (Pratiwi, 2013). The average cow milk production in BBPTU FH-HPT Baturraden 2014 and 2015 based on real data and data standardization towards adult body (ME) is presented in Table 1.

Table 1. The milk production and standardization of the adult body (ME) on FH cattle in BBPTU-HPT Baturraden

Record Method	The average of milk production (liter)		Correction factor (%) of ME
	Real	Standardization of ME	
Complete	3.724,90	4.248,77	14,06
Incomplete	3.677,49	4.191,87	13,99

The average of milk production in BBPTU-HPT Baturraden was 3,724.90 liters whereas if standardized against ME at 305-day, milk production averages obtained to 4,248.77 litres. The old 305 day lactation standardization based on the calculation that a dairy cow most optimal if it can be increased once a year, with long drying of 6 to 8 weeks (Hardjosubroto, 1994). The average cow milk production in Indonesia of FH 3,050 liters per lactation (Sudono et al., 2003). Based on the literature, milk production at HPT-BBPTU Baturraden higher than average milk production in Indonesia. Livestock production is influenced by many factors, include: hereditary factors (genetic), feed, management, eradication, disease prevention and environmental factors. Genetic factor has influence of 25% to 30% Mukhtar, 2006).The result of t-test show that the average of milk production based on incomplete and complete record is non-significantly differences. The percentage of errors is – 1.34%. The error percentage is negative (-), it means milk production results of estimation on the basis of incomplete records smaller than the real milk production. If the percentage error is positive (+), it means that the results of estimation based on milk production of 15th day of the month of lactation is larger than milk production based on complete record. The meaning of -1.34% is the average milk production which obtained from the incomplete records lower than complete records (1.34% different). So, the milk production calculation require additional of 1,34% from the milk production estimation (Anggraeni, 2012).

The Graph Of Milk Production

The graph of average milk production and the percentage of milk production per month based on complete and incomplete records data are presented in Figure 1 and Table 2.
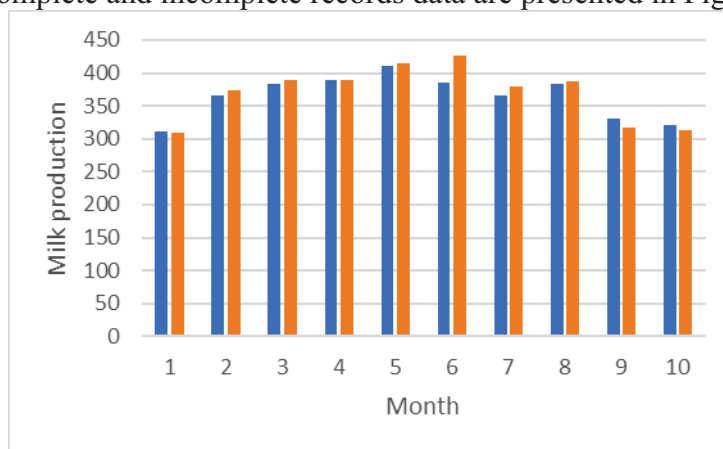
Figure 1. The graph of average milk production per month
based on complete and incomplete records data

Table 2. The average of milk production per mounth based on complete and incomplete records data

Mounth	Complete records (%)	Incomplete records (%)
1	8,3	8,6
2	10,1	10,0
3	10,5	10,5
4	10,6	10,5
5	11,3	11,2
6	11,5	10,6
7	10,3	10,0
8	10,5	10,5
9	8,5	9,2
10	8,4	8,9
Total	100	100

Figure 1 shows that the average milk production per month based on the complete record (red) and the notes are not complete (blue colored) is relatively similar. Milk production in the early has increased and after it reachs a peak of lactation then it decrease. According to the Mukhtar (2006), at the beginning of lactation milk production continued to increase rapidly and after the peak production is reached, milk production tends to decrease until the cow through dry. Milk production in dairy cows is a dynamic process that forms a curve (Anang et al., 2010). The curve in the early lactation will increase to the top of lactation which is then gradually decreased until the end of lactation (Kurniawan et al., 2012).

CONCLUSIONS

The estimation of average cow milk production in BBPTU FH Baturraden HPT use complete and incomplete record is is not significantly different, so the calculation of the milk production by using incomplete records of 15th day of each month during lactation can be used as an alternative in the recording of milk production with the percentage error of -1.34%. Milk production at BBPTU-HPT Batturaden is higher than standard FH cow milk production in Indonesia.

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