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REASONS FOR CULLING AND REPLACEMENT RATE IN DAIRY CATTLE

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Abstract

The replacement rate in cattle breeding has an important effect on the profitability of breeding as well as the success of the breeding program. Culling decisions play an important role whether the herd replacement rate is high or low. The replacement rate in cattle breeding has an important effect on the profitability of breeding as well as the success of the breeding program. Removal decision from herd will play an important role whether the replacement rate high or low. The reasons for culling were reported as low milk yield (29-36%), reproductive problem (15-27%), mastitis (18-23%) and other causes (25%). On the other hand, voluntary and involuntary culling rate are shown as 43,7% is 56.3% respectively. This rewiev focussed on evaluating the reasons for culling of cows, replacement rate, herd life and productive life in dairy cattle enterprises.

Key words: *cattle, culling, productive life, longevity.*

INTRODUCTION

In Dairy enterprises, the longest productive lifespan of cows is desirable. However, during the year-round cows are culled from the herd for various reasons or have to be culled. Culling may be defined as removal of cows from the main herd due to different reasons which are usually Involuntary and voluntary culling (Martin 1992; Neerhof, 2000; Weigel and Palmer, 2002). Involuntary culling implies that cows were culled due to disease, injury, bodily defects, mastitis, infertility or death. Low yield or selling of cows are examples of voluntary culling.

Since longevity has played an important role in enterprise profitability in recent years, it has begun to taken into consideration handled specially in breeding programs.

The survival period is the productive period between the date when the first calf of the cow was born and the date of culling. In other words, number of calves that the cow gives birth or lactation number completed during the life-span of the cow. Therefore, longevity is expressed as productive life (Martin, 1992; Powell, 1997; Kumlu and Akman, 1999).

Herd life is a low heritability trait. In studies carried on this traits, 10% of the phenotypic variation due to the genetic effects only has been reported (Martin, 1992; Faust, 2003). For this reason, optimization of environmental conditions is the most important factor increasing the cow longevity (Savaş et al., 1999).

Productive Life

The productive life can also be defined as the life-span of a cow. Life-span of cows is the time from birth to culling time or died. This criterion includes growth, production and dry period.

Keeping cattle in herd as stable, healthy and productive form for a long time will in particular benefit the enterprises and the country in general. It will be possible to reduce the cost of veterinary and medicines, decreasing of replacement cost, increasing the proportion of cows removed from herds voluntarily, increasing of selection intensity as a result increasing of genetic improvment by staying in the herd a long time (Setati et al., 2004).

It was found the mean duration of staying in herd 36.8 ± 2.60 months (Kara et al., 2010). This value indicates that cows are used for breeding average of 3 years. It is considered to be ideal staying in herd for 4 years in cattle breeding. Because, it is possible to obtain enough breeding heifers to replace the cow removed during this period (Kumlu, 2003).

Longevity

Most dairy farmers are fully aware of the importance of achieving a low herd replacement rate. High replacement rate increases the cost. The most important things to do is to decrease the replacement rate in the herd. It will beas long as possible to keep cows alive till die. In order to keep animals they must maintain their efficiency in the desired scale. For example, there is no reason to keep a cow which is not getting pregnant or reduced milk production due to mastitis. For this reason, it is more appropriate to use the concept of productive life rather than life-span expression for a production animal. Productive life is the time from first calving to culling. Long productive life means is reduction in replacement rate.

When productive life is known, the herd replacement rate can be calculated. If the productive life (PL) is expressed in months, the herd replacement rate; HRR = 12 / PL, if the productive life is expressed in years, it is calculated by the equations of HRR = 1 / PL. For example, if the productive life is 40 months, the rate of replacement will be 12/40 = 0.30 = 30% (Akman, 2003).

When the culling rate increases, the number of pregnant heifers will be increased for keeping the herd size. At this stage, it may be necessary to calculate the number of pregnant heifers to be produced from this herd and how many heifers will be sold in a year to keep herd size. The number of pregnant heifers to be produced depends on birth rate. If the the calving interval in one herd is 14 months, The highest value for birth rate is calculated as 86% (12/14). However, this rate should not be considered for the heifers calving for the first time.

Reasons for culling

Cows are removed from the herd for various reasons. In many studies, it has been observed that cows removed from the herd for involuntary (forced) reasons are between 50% and 80% of all cows removed from the herd (voluntary + forced) (Bascom and Young, 1998; Seegers et al., 1998a; Stevenson and Lean, 1998; Beaudeau et al., 2000; Yaylak, 2003).

Causes of cow removal from the herd are possible under two category; voluntary (mastitis, foot-leg problems, disability, reproductive problems, sickness, old age and death) and forced (low milk yield, external appearance characteristics, behavioral problems.

However, Fetrow et al. (2005) rejected this grouping and they argued that it would be more appropriate to collect the reasons for removed from herd under two category: biological and economic reasons as an alternative (Table 1).

Table 1.Traditional removal reasons and category recomended by Fetrow et al.

Traditional	Reasons for Removal	Fetrow et al. (2005)
Voluntary	Low yield Overstock	Economic
Involuntary	Mastitis Udder structure Lameness Reproduction Problems (except infertility) Aged	
	Serious disability Disease Infertility Death	Biological

According to the traditional category, only low yield and overstock breeding or butchery sales are considered to be the reason for voluntary removal, and all of the remaining reasons are shown among the involuntary while Fetrow et al. (2005) considered as the biological removal reasons only that led to loss of the possibility of being productive in the future.

Biological causes were included as death, completely sterile, seriously disabling, compulsory slaughter and incurable diseases. In contrast, they put mastitis is not an involuntary but among the economic reason. They claimed that the breeder do not remove every cows suffering from mastitis from the herd, however replace it when they finds better one or when they meet economically unacceptable yield loss. Therefore, this is not a forced removal such as death, seriously disabling or infertility, but for economic reasons.

Bascom and Young (1998) found that cows were removed for involuntary reasons as 78%, Seegers et al. (1998) 71%, Yaylak (2003) 56%

and Light (2006) 69%. In the study done by Işık (2006) to show the rate of removal from herd, fertility problems took place in the first with 31%, it follows the overstock breeding sales and the milk yield decrease. In the first three ranks of research conducted in this respect, infertility , udder problems and low productivity or overstock sales were reported (Martin 1992; Bascom and Young, 1998; Seegers et al., 1998; Yaylak 2003).

CONCLUSIONS

In Dairy cattle enterprises, the rate of herd replacement and removal which are important indicators of herd management and breeding should be determined by making yearly calculations to determine the number of cows to be needed in terms of enterprises, region and country and concrete suggestions and solution should be taken.

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NUTRITION