

Case Discussion on Current Problems Related to the Lifespan of Female Bovine Animals in Camagüey, Cuba

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Abstract

In order to scrutinize the current problems related to the useful life of the female bovine in Camagüey, the causes that had an impact on this area of great importance for the local and national economy were studied, as well as the fundamental problems that harass her, for what which took into account the main results of similar analyzes carried out by researchers from our scientific community and other parts of the world. Concluding that the female bovine in our province, is incorporated late to reproduction, an inconvenience that shortens its reproductive life and compromises the positive balance in the herd. These results cause an unfavorable impact on its maintenance and growth, limiting the development of a sustainable economy in our province, which could be reversed with adequate zootechnical management and better preparation of the personnel involved.

Keywords: *LAge at Incorporation; Cattle; Reproductive Efficiency; Useful Life; Zootechnical Management*

Introduction

The reproductive process is the essence of the biological renewal of all species. High reproductive efficiency is a prerequisite for economic success, both in dairy and beef farming. It is known that to be successful, females in a bovine herd must achieve rapid growth, from birth to puberty, and subsequently reach an appropriate weight and age for gestation and first calving [1].

The longevity of the cow and the reasons for culling it is one of the most important research problems in contemporary cattle rearing [2]. Longevity traits and their useful life are good indicators of the effectiveness of management and animal welfare [3].

Performance characteristics of the half-life of the cow may include: length of productive life, number of lactations, average days in lactation, and average productivity over certain time periods. Longevity refers to the period that a cow remains in the herd and, in this sense, if its biological potential is taken into account, current dairy cows have little time in production [4].

Trying to make the useful life of a cow profitable starts from the incorporation of the heifers at the appropriate time, so it is necessary that they develop at a good pace from birth to parturition, which will allow an earlier return of the heifers. The investment made, fewer heifers will need to be reared by maintaining the same replacement rate and fewer difficulties in calving with early renewal of postpartum estrus and substantial increases in milk production in the first lactation [5].

It is known that, in tropical and subtropical countries, there is generally a significant delay in bovine females to reach the weight and development necessary to be incorporated into reproduction, with the consequent delay also in the achievement of their first calving, everything which negatively affects the overall duration of the female's productive life [6].

The reproductive efficiency of dairy cattle is often defined as the calving interval on the farm. This indicator has a great influence on the time that cows show their best milk production, which is usually the first 120 days in production. In addition, the calving interval affects the amount of milk produced per day on the farm and the level of cow shedding due to reproductive failure. The economic benefits associated with this financial flow contribute to the profitability of reproductive programs on dairy herds [7].

In cattle farms, both dairy and meat, it is important to achieve one calf per cow and per year, in order to maintain their profitability, since both the efficient production of milk and meat depends to a great extent part of achieving that proper 12-13 month "Birth Interval". It also depends on it that enough replacement females are born to maintain the size of the herd and even increase it [8].

Due to the great importance of the development of the cattle mass in our province, in the interest of a greater availability of food in the midst of a global economic crisis, the objective of this work is to analyze the current problems related to the useful life of the female bovine in Camaguey.

Case discusión

Causes

For the rearing of specialized milk-producing cows to be successful, each cow, in a period of one year, must leave a calving (one calf) and a productive campaign of 10 months of milk production [9].

This author indicates that the discard rate is the proportion of cows that are discarded or eliminated in a stable dedicated to the rearing of specialized cows for milk production, in each operating year, which plays an important role in the economic aspect, as well as in the stabilized population of animals in a stable, the culling of cows can be done for two types of causes:

Unintended causes: they occur when the producer finds himself in the need to remove cows from the barn due to reproductive problems (infertility) or mortality. From a technical point of view, specialists recommend that this type of cow elimination does not exceed 10% per year (9 for infertility and 1 for mortality).

Voluntary causes: they obey a system directed as a consequence of a selection process, according to the objectives defined by the farmer. Among the causes of this group we have the following: culling cows; due to low milk yield (previous genetic evaluation process); due to poor anatomical conformation (sloping udder, foot and leg problems); due to clinical mastitis problems, advanced age or changes in the size of the barn.

The traditional elimination of cows for these items fluctuates between 10% and 15% annually (10 for low production, 3 for defective udder; 2 for clinical mastitis). Consequently, adding both causes the annual cow culling rate in a conventional dairy herd fluctuates between 20 to 25%.

The useful life is understood as the bioproductive capacity of the dairy cow that provides the producer with economic productive benefits under the conditions that determine the increase in the efficiency of the individual cow and the herd. The development of science in bovine reproduction is currently aimed at taking advantage of the reproductive potential [9].

Reproductive efficiency depends on the efficiency with which estrus is detected and cows are gestated, these can be influenced by physiological and management factors, although the latter can be modified by a good program of regulation of reproduction [10].

As man is a fundamental factor in the mismanagement of the reproductive cycle of the herd, in the use of the most appropriate technology that reflects the efficiency of the production process and the fertility measurement criteria that are currently used involve: puberty, childbirth, puerperium, reproductive indices, longevity and fitness of the male.

Current implications

In the analysis of the behavior of the indicators for total deliveries, cull age, gestation incorporation interval and age at first delivery show the shortened useful life and the large losses that are generated, for which they recommend that it be necessary to improve management of the herds due to the implication it has on the duration of the reproductive life of the females, the attention to the developing female to reduce the age of incorporation to the reproduction and develop training plans for the producers in the management, control and evaluation of reproduction. These authors conclude that the reproductive life of females was 6.5 years on average in the province of Camagüey [11].

Reproductive development depends on the interrelationships between internal management and factors inherent to females, but the most important limiting factor is management and human intervention [7]. The research experiences related to the study of reproductive efficiency allow us to identify that the factors of the animal, those of nature and the ability of man are the determining factors to determine the low efficiency of reproductive life, the delay in the incorporation to reproduction, perform the first service, lost jealousy or multiple services per conception and is the biggest problem in dairy herds.

Recognition of the problem

If we value the interpartal period (PIP), which is the average number of days that elapse between one parturition and the next, as the most precise and practical reproductive parameter when evaluating reproductive efficiency, and considered as the one with the greatest economic impact; since it represents the efficiency with which the products that are the reflection of income are generated and that, therefore, determines the economic performance of livestock [12], these criteria of different authors allow to affirm according to different results that than it is seriously affected the birth rate and therefore the milk production; what conspires against the reproductive future of females as reported [13-15].

The dairy company has the objective of producing an annual calf per cow, which implies achieving a PIP of one year, for which it is necessary to perform an optimal management from the birth in order for the cow to have a good involution of the uterus and so it can come into heat quickly [16-17]. Subsequently, the precision in the detection of heat is decisive to be more efficient in conception [18], in order to maintain between 8 and 9% of pregnant animals each month [19].

On the other hand, the short duration of this parameter provides a positive panorama of the adaptation of the animal in the environment it develops [12]. But when the "ideal" period is exceeded, problems such as the extra cost of insemination, increased services per gestation, the excess number of cull cows, calf losses per cow, among others.

These setbacks have repercussions causing economic losses and one of the main causes of the shortening of the reproductive life of females [20], as well as the decrease in the number of births per life [21].

This is why PIP is one of the reproductive parameters that most affects the reproductive performance of female bovine animals [13,22].

In their study about the seasonal behavior of bioeconomic indicators [23], they point out that the calving interval (PIP) is a very important indicator that should be evaluated in cow herds, finding an average of 510 days for the evaluated units, less than what was reported by [24]. Similar studies [25] refer that the Cebu Brahman, 30.5% presents a PIP of 451 to 540 days in Colombia, with 7% that exceeds 612

days, on the other hand [26], they found an average of 466, 85 days for this indicator in the Criolla breed in Granma, [27], reported values of 456 in the Chacuba breed, 76 days for this indicator, while [28] reported 539 for the Jersey breed, 8 days in the Camagüey province.

Another cause of the shortening of the useful life of the female bovine is when the age at first calving increases appreciably; which prevents the female from entering the production group; generating economic losses [29].

In various investigations carried out in Cuba, the productive life of the animals exceeds four years from the first artificial insemination, which is described as regular, since the intervals between parturitions exceed 18 months, so the number of parturitions it only averages 3.66 in most herds, with a productive life of 48.66 months [30].

The age at first calving in the country is an average of 48 months, since heifers do not achieve adequate weight due to the poor diet existing in the tropics with its consequences in shortening the lifespan of the female [29], reports values between 35 and 40 months which are higher than those declared by [31] for this indicator with 28.6 months.

Other researchers such as [9,32], gave mean values of 23-25 months. In reports by [33], carried out in more than 190,000 Holstein Friesian females, show an average age at first calving fluctuating between 24.83 and 25.26 months, these authors also demonstrated that when females have their first calving close to after 24 months, they have a better chance of survival of the newborns and a better use of the reproductive life of the females.

In this sense, numerous studies indicate that the ideal age for obtaining the first parturition in dairy cattle should fluctuate between ages as early as 20-25 months. However, others have found optimal ages at first calving in Holstein females of 24-30 months, where they observed the highest production rates at the first lactation, the longest average productive life span, and the highest longevity index [34].

It has been calculated that each month that the age to the first calving is delayed by more than 22 months, it has an impact of 100 USD per animal and per month, taking into account above all the potential milk left to produce and the decrease in the days of productive life of the animal [32], an issue also exemplified by other authors who demonstrate a reduction in age at first calving when feeding and other factors are improved [23,35].

The number of parturitions during the reproductive life of the cow in different units of the private sector in Camagüey was 3.66 [35], which indicates that the females are incorporated to reproduction late, at that time they still do not present all their somatic reproductive potential, so they must wait even longer to be inseminated with a substantial additional delay to achieve their first calving.

In this regard [36], they suggest that the fertility of cattle is fundamental in the economy of dairy farms, hence the inclusion of reproductive characteristics, including the age at first calving, is essential for improvement programs that want to optimize the overall efficiency of the herd. This trait is closely related to the age at which bovine females reach puberty and their future reproductive performance [37]. There are few authors who refer to the advantages of gearing heifers at an early age [21], highlighted the following: return of the resources used during the unproductive stage in a shorter period of time, lengthening of the reproductive life of the cow and the number of calves to be obtained, which will constitute the replacement of the livestock mass.

To reach a maximum lifetime production, cows must give birth for the first time between 24-27 months. The age of the female at the first parturition provides important information on the reproductive and economic efficiency of the herd, since its delay causes a decrease in profitability, in the rate of genetic progress and in the useful reproductive life, generating significant economic losses [11, 38, 39].

The researchers [40], suggest that the useful life or reproductive life is a measure of the permanence of the cows in the herd and considers the number of years during which the cows maintain a normal reproductive capacity without impairing their productive or repro-

ductive behavior; a greater longevity partially repairs the time lost due to the reproductive delay of the heifers, due to a lower efficiency after the first calving and due to the lower productive capacity during the first three lactations.

Taking into consideration what was raised by [41], regarding the “useful life” of a dairy cow, which is measured in terms of the number of dairy “productive cycles”, viable as long as a “conception” has occurred in the previous period, our research detected that 3.3% of the females had less than three years of reproductive life and only 23.33% managed to exceed six years.

Researchers such as [11], recommend that it is necessary to improve herd management due to the implication it has on the duration of the reproductive life of females, the attention to the developing female to reduce the age of incorporation to reproduction and develop training plans for producers in the management, control and evaluation of reproduction [42].

The low efficiency of reproductive life depends on the delay in performing the first service, lost heat or multiple services per conception that lengthen the interpartal period and constitute the greatest problem in dairy herds [43,44].

The economic impact as a consequence of a short reproductive life in female bovines can be high, which is evident worldwide without distinction of the level of development. In countries like Sweden, national averages for this indicator have been reported in dairy cattle below 2.6 years. The following reproductive life averages have been reported for different bovine breeds: Holstein 3.43 years; Brown Swiss 2.65 years; Brahman 1.47 years, with highly significant differences between the three groups [21].

This is an aspect of total relevance to consider if we want to achieve a greater permanence of the cows in the herd (more than 11 years), which is achieved when they calve for the first time with an average of 32.7 months of age, according to the results obtained by [39], in a study that included 46,726 records, an indicator that is not met in the conditions of exploitation of the bovine females under study and that threatens the reproductive life of these animals.

Preventive measures and problem solving

Improve herd management due to the implication it has on the duration of the reproductive life of females, as well as attention to the developing female to reduce the age of incorporation to reproduction and develop training plans for producers in management, control and evaluation of reproduction.

Among the factors that influence the productivity of livestock farms are the live weight of the heifers at calving, therefore, when incorporating the heifers, the main objective of the farmer must be to achieve animals that can be satisfactorily served nine months before they reach the weight and body condition required for entry to the milking herd. In this way, it is intended that the animal presents an acceptable productive behavior in addition to a productive and longer useful life.

Measures aimed at improving feeding, using options such as: supplementation with forage (ground cane or King grass), the application of silvopastoral, the use of protein banks, the use of live fences delimiting pasture areas and the use of legumes associated with grasses. In this way, the causes of female waste in the period of less food availability would be avoided, especially those that had a greater impact in these months, and thus obtain an adequate waste rate and therefore, a better use of the female lifespan.

Conclusions

In our province, the bovine female joins reproduction late, an inconvenience that shortens its reproductive life.

Conflicts of Interest

There is no conflict of interest.

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