

Factors Affecting Fertility of Dairy Cows in Algeria

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Abstract: Herd reproductive problems had a major economic impact on animal production. The aim of this study was to identify factors responsible for infertility in dairy cows and to provide information on the health status and reproductive performance of dairy herds in Algeria. Data showed that the highest conception rate on the three farms averaged 54.05% and 57.30% for the first artificial insemination and 58.25% on farm B for the second. The different pathological problems observed in the three farms were abortions, dystocia, retained placenta, mastitis and post-natal mortality. Abortion was observed at prevalence rate of 8%, 6% and 7% on farms A, B and C, respectively. Retained placenta was observed at highest prevalence rate of 6% on farm A whereas dystocia and post-natal mortality were observed at prevalence rate of 5% on farm C. Mastitis was observed at prevalence rates of 5% and 8% on farms B and C, respectively. All these factors may directly or indirectly influence fertility in dairy cows even if the conception rate observed on the three farms was acceptable.

Key words: Dairy Cow • Conception Rate • Abortion • Dystocia • Retained Placenta • Infertility

INTRODUCTION

There are various factors associated with decreasing fertility, especially those related to management. In the evaluation of reproduction, it is important to differentiate between the concepts of fertility and reproductive performance, which is defined as the female's ability to produce a live calf.

Reproductive performance is affected by fertility, embryonic and foetal development, calving and calf survival. Reproductive performance is calculated using various indicators such the number of days open (The interval between calving and successful artificial insemination) or the interval between successive calving. These two indicators are influenced by cow fertility as well as by other herd management factors, such as heat detection and the length of the voluntary waiting period (Interval between calving and time to first artificial insemination).

Cow fertility is generally evaluated by the conception rate, defined as the proportion of cows declared pregnant

following artificial insemination. This indicator is inversely related with the number of artificial inseminations per conception [1].

Previous studies had shown that disease, whether or not it is associated with the reproductive system, has a greater impact on fertility than milk production. Canadian Herd Improvement data analysis has shown that metritis, dystocia, lameness, mastitis and retained placenta all have a negative effect on conception rate 1, decreasing it at respective rates of: 8.0%, 6.0%, 4.3%, 2.8% and 2.5% [2].

Many specific reproductive health problems, such as, true anoestrus, ovarian cysts, abnormalities of the puerperium, retained placenta and metritis are quite common in dairy herds. They require a good reproductive health program, which is essential for efficient reproduction not only because it generates data necessary for breeding management, but it also allows for checking normal uterine involution and return of ovarian cyclicity [3, 4].

The objective of this study is to identify the major

pathological types of herd infertility problems and to determine their incidence on reproductive performance in Algerian dairy cows.

MATERIALS AND METHODS

Three farms were chosen for this study, as described below.

Farm A: Included 120 cows among them 78 were used for breeding. The data in this farm were computerised.

Farm B: Included 20 cows (10 breeding cows)

Farm C: Included 9 cows (8 breeding cows)

On farms B and C, data were recorded on individual cards. The three farms A, B and C were used for milk production and in which they used artificial insemination as a means of reproduction.

The collection of statistical data was given by veterinary technicians engaged in these farms. They related to the conception rate obtained after artificial insemination and infertility factors observed in breeding cows.

RESULTS

Different reproductive conditions were observed in our study. On farms A, B and C, abortion was observed at respective rates of 8%, 6% and 7% Mastitis was observed at respective rates of 5% and 8% on farms B and C.

Retained placenta was observed at prevalence rate of 6% on farm A, whereas dystocia and post natal mortality were observed at prevalence rate of 5% on farm C. Dystocia was observed at variable rates in the three farms. It is on farm C where the prevalence rate was remarkable as 5% (Table 1).

The conception rates on the three farms averaged 54.05% and 57.30% for the first artificial insemination and 58.25% on farm B for the second (Table 2).

DISCUSSION

Prevalence rates of fertility and fecundity on farms A (54.05%) and B (57.30%) were apparently higher than those recorded on farm C (31.25%) for the first insemination. This can be explained by the number of cows used on farms A and B.

These rates were obtained from the first insemination for farms A and B. On farm C, the highest fecundity rate was obtained from the second insemination (58.25%). Inseminations were performed at interval between 12 and 13 months after calving.

Among the infertility factors observed on these farms was abortions (8%, 6% and 7% on farms A, B, C, respectively).

Causes of abortion can be either infectious or non-infectious [5, 6]. In about 70% of abortions, the cause cannot be determined even with careful laboratory examination. In the absence of specific infections, a herd abortion rate of around 3% is normal [7].

Table 1: Infertility factors observed on farms A, B, C

Farms	Total dairy cows (n = 107)	Samples (on each farm)	Infertility factors (%)				
			Abortion	Dystocia	Mastitis	Mortality	Retained placenta
A	78	18	8	3	3	3	6
B	20	8	6	2	5	4	2
C	9	10	7	5	8	5	4

n number of dairy cows

Table 2: Conception rates by artificial insemination on farms A, B and C

Farms (n = 107)	Samples	Conception rate (%)					Month ICC
		AI1	AI2	AI3	AI4	AI5	
A	78	54.05	17.11	14.72	04.61	3.66	13.66
B	20	57.30	24.00	03.30	03.30	–	12.61
C	9	31.25	58.25	14.50	–	–	13.30

n number of dairy cows

AI artificial insemination

ICC interval calving/calving

Metritis and retained placenta subsequent to *Brucella* abortion can cause enough damage to compromise fertility in cows [8]. Therefore, the reproductive efficiency in a flock infected with brucellosis is still lower than that recorded in a healthy flock [7].

Mastitis were observed in the three farms at different rates, 3% on farm A, 5% on farm B and 8% on farm C. These rates are lower than those reported by Heringstad *et al.* [9] and Kadarmideen and Pryce [10] in different dairy populations. Retained placenta was more common on farm A (6%), followed by farm C (4%) and B (2%).

The conception rates on the three farms averaged 54.05% and 57.30% for the first artificial insemination and 58.25% on farm B for the second (Table 2).

On a herd basis, the condition can adversely affect milk yield and fertility, but on an individual basis, the effects are unpredictable. Incidence of retained placenta in dairy herds should not normally exceed 8% [7].

The effect of retained placenta on subsequent reproductive performance is unclear. Some report that this condition has no significant effect on fertility [11] whereas other authors have demonstrated impaired fertility and shortened reproductive life in cows with reproductive tract abnormalities which were more frequent after retained placenta [8, 12].

The different causes of dystocia in cows versus heifers is due to the differences between the two animals. A heifer is still growing, so she will be smaller than a mature cow. Also a heifer has never had a calf before, so the tissues of the birth canal (Cervix, vagina and vulva) have not ever been dilated. Thus, dystocia in heifers is often due to the birth canal not dilating or stretching sufficiently [13]. Dystocia can often be relieved by manually dilating the vagina and vulva.

When dystocia occurs in cows however, it is usually the result of a more serious problem. The size of their birth canal is less restrictive than that of a heifer so when dystocia occurs, there may commonly be another disease process (Milk fever), the calf is extremely large, or the calf is malformed or malpositioned. In both beef and dairy cattle production, dystocia most commonly occurs in heifers.

Prevalence rates of dystocia in breed heifers were estimated to 6.6% in France, 3.8% in New Zealand, 2.6% in Spain and 13.7% in USA respectively [14-16]. Prevalence rate reported in the present work (5% in Farm C) was lower than the rates found in USA and France but higher to the ones of New Zealand and Spain.

Dystocia is also reported to be the primary cause of calf loss in two-year-old beef heifers [17]. In contrast, in older breeders dystocia is generally insignificant with estimates ranging from 0.8% to 3%.

In conclusion, all these pathological conditions may directly or indirectly influence fertility in dairy cows even if the conception rate observed in the three farms was more or less acceptable.

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