



Study the effect of number of parturitions on the measurements of reproductive performance of dairy cows

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Abstract

This study is conducted in Latifiya station for dairy cows in south east of Baghdad. Which have Holstein and Friesian and cross breed among them, from the first of April 2012 until the first of August 2014. Dystocia rate 69.81% recorded and also 26.8% retained placenta with 16% ovarian problem and 53% uterine problems for (386) cows.

The cows of research are divided into four group according the number of parturition and four reproduction performance parameters are used.(calving interval) ,(open day) ,(conception from first service) and finally (services per conception).The results are in the first group (2parturitions) (121) cows were 423.7 day for calving interval ,107.1 days open ,27.4% conception from first service and 2.3 services per conception ,the result of second group (3parturitions) (106)cows were ,458.3 day calving interval ,188.1 day open days, 25.3% conception from first service and 2.28 services per conception that statically significant. The result of third group (4 parturition) (120)cow record 427.6 days calving interval ,156.2 days open ,37% conception from first service ,and2.15 services per conception. with statistical significant difference at $p < 0.01$. The last group (5 parturitions) (58) cow also record 378.8 days calving interval ,101.8 days open ,49% conception from first services and 1.76 services per conception .The results of last two groups have statically significant at $p < 0.01$ from first and second groups.

Key words: Reproductive performance, Dairy cows.

دراسة تأثير عدد الولادات على مقاييس الاداء التناسلي لابقار الحليب
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الخلاصة:

تهدف الدراسة الى التعرف على تأثير عدد الولادات على بعض مقاييس الاداء التناسلي لابقار الحليب. اجري البحث في محطة اللطيفية لتربية ابقار الحليب جنوب شرق بغداد والتي يربي فيها ابقار من سلالة الهولشتاين والفريزيان والمضربة بينهما للفترة من الاول من نيسان 2012 لغاية الاول من اب 2014. تم استخراج نسبة عسر الولادة 69.81% واحتباس المشيمة 26.8% ومشاكل مبيضية 16% ومشاكل رحمية 53% ولمجموع (386) بقرة بعدها تم تقسيم الابقار الى اربعة مجاميع حسب عدد الولادات لكل مجموعة مع استخدام اربعة مقاييس للاداء التناسلي (الفترة بين ولادتين) و(الايام المفتوحة) (نسبة الاخصاب من اول تلقيحة) و(عدد التلقيحات اللازمة للحمل). وقد كانت النتائج لابقار المجموعة الاولى ذات الولادتين (121) بقرة 423.7 يوم فترة بين الولادتين و 107.1 ايام مفتوحة و 27.4% نسبة اخصاب من اول تلقيحة و 2.3 تلقيحة لازمة للحمل. اما نتائج المجموعة الثانية ذات الثلاث ولادات (106) بقرة 458.3 يوم للفترة بين الولادتين و 188.1 يوم ايام مفتوحة و 25.3% نسبة اخصاب من اول تلقيحة و 2.28 تلقيحة لازمة للحمل وبدون فارق احصائي معنوي عن المجموعة الاولى. اما نتائج المجموعة الثالثة ذات الولادات الاربعة (120) بقرة فكانت 427.6 يوم للفترة بين الولادتين و 156.2 ايام مفتوحة و 37% نسبة الاخصاب من اول تلقيحة و 2.15 تلقيحة لازمة للحمل. وبفارق احصائي معنوي $P < 0.01$ عن المجموعة الاولى والثانية. في حين ان المجموعة الرابعة ذات الولادات الخمسة (58) بقرة فقد كانت نتائجها هي 378.8 يوم فترة بين ولادتين و 101.8 يوم ايام مفتوحة و 49% نسبة اخصاب من اول تلقيحة و 1.76 تلقيحة لازمة للحمل وبفارق احصائي معنوي عند $P < 0.01$ عن نتائج المجموعة الاولى والثانية.

Introduction:

Dystocia: which is known as a difficult birth, where the dam needs external assistance and especially in the second stage of parturition. There is a variation in the proportion of dystocia in cows depending on the number of births per cows, in cows with first birth, the percentage of dystocia was 66.5% while the percentage was 14.3 in cows with third birth (2).

Dystocia has reasons relate to dam and others relate to fetus, the ratio of reasons relate to dam was 14.5% while the rate of 85.5% for reasons related to fetus (3).

The most important reasons for dam are insufficient expulsion of fetus that involve defects in the uterine muscles resulting from genetic factors, fat degeneration, nutritional deficiencies, systemic and infectious diseases, or chemical deficiency resulting from imbalance of sex hormones and of increasing of progesterone level and lack of estrogen level, in addition to the deficiency of calcium and

magnesium leads to increase to percentage of dystocia (2, 4). And abnormal presentation of fetus is one of the factors that increase the likelihood of dystocia especially when there is twin's birth (5).

Retained placenta: means the failure of detachment of fetal membranes and failure of expulsion them from uterus during the physiologic third stage of parturition and up to 6-12 hours after birth. Retained placenta varies in incidence in cows depending on the status of parturition. It has been recorded 8% in normal parturition, and 25-55% in abnormal births (2, 6), in addition to low levels of prostaglandins which greatly affect the occurrence of this case, and this case also resulting from placentitis due to brucella infection. Retained placenta may occur from abortion resulting from microbial invasion, and similar things of abortion like induction of premature birth by usage of cortical hormones as well as twinning birth is a contributing factor

increases likelihood of retained placenta after birth (2, 7). The uterine inertia resulting from calcium deficiency especially in dairy cows with vitamin A and selenium deficiencies and uterine fatigue due to prolong dystocia have clear effect in incidence of retained placenta(8).

Calving interval: it is a period calculated in days and extended between two successive parturitions of one cow or several cows. It is one of necessary indicators to determine the level of fertility in the field, and this period is estimated at about 365 days. This measure is influenced by days open and pregnancy rate for cows. Thus, the factors affecting the open days are the same affect on this measure (9).

Days open: are days extend from parturition until the fertilization occurs for fertilized cows, and are days extend from date of birth until the culling for unfertilized cows. It is an important measure used within the herd to get to know of fertility of cows or measure can be adopted in judging the cows that are excluded because of the length of this measure. It also refers to the measure of profit and loss in the herd, and the first parturition cows are less affected by days open in comparison with multiple births cows. The rate of days open varies according to many studies, and it is generally estimated up to (90) days (11).

This measure is influenced by several factors include:

- 1- Age: (12) indicate that small aged cows (two years) have days open longer than the older cows (four years) or more. The same researcher attributes this variation to the length of period between parturition until first estrus with increasing the proportion of cows that suffer from anestrus after birth, leading to prolong the period to

the first service and period between the first service and occurrence of conception.

- 2- Health and reproductive care: the implementation of program of health and reproductive care within the herd has a significant impact in reducing the period of days open, and that the implementation of this program need to competent veterinarians to stand on the reproductive problems faced by the herd and choose the best way to solve them in the short time, and the use of computer at the station led to short duration of days open (13).
- 3- Mastitis: days open in sound cows-mastitis were 8842 days, in comparison with 10715 days in cows with inflamed udder (14).

Number of services per conception: one of the most important measure of fertility in herds of cows and represents the number of services per conception for one cow. It is extracted by dividing the number of services for all cows on the number of fertilized cows. The ideal rate is (1.5), which is the target of breeders. The accepted rate in the herd of cows is (2) for the herd cows. This measure is used in culling of cows that have been recorded more than (3) services, on the other hand the small aged cows(2 years age) have more number of services than older cows(11).

The style of successful management and the appropriate cooperation with the theriogenologists have the huge effect in raising the level of reproductive performance by controlling the uterine inflammation and ovarian hormonal disturbances especially in the postpartum period leading to lowering the number of services per conception compared to

other herds missed this style in their management(15).

Conception rate from the first service: an important measure used in AI centers and herds of cows to get to know the level of fertility of bulls and reproductive performance of cows and represents the percentage of cows and heifers that were serviced one time and went on this service a specific period(30-60) days or (49) days(9).

The accepted percentage for this measure within a herd of cows is 60%, and the 2 years old cows have conception rate from first service less than older cows(2).

The factors influencing the decreasing and raising this measure include the uterine diseases where a 7.7% has been recorded for cows suffered from severe uterine inflammations compared to intact cows where 68.7% recorded for them from first service and here the efficiency of treatment stands out in return of the cows with uterine infections to their accepted reproductive performance(16).

Each of ovarian cysts and estrus detection in cows have low conception rates from first service in comparison with cows have no ovarian disorders and with typical estrus signs (17).

Materials and methods

This study was conducted at Latifiya station for breeding dairy cows; the cows were from Holstein and Friesian breeds and crossbreed between two breeds. The system of this station is opened system for husbandry, and relies on green, dry, and concentrated feed.

Research information was extracted from the records and computer of the station, where the

ratios of dystocia and retained placenta were extracted, and also of ovarian and uterine problems. And by a percentage for a number of cows (386) in this station.

The cows were divided according to the number of births for them into four groups. The first group has two births, the second has three groups, and the third has four births while the last group has five births. and the cows used in this research were in different numbers and according to the number of the births.

The process of diagnosis of dystocia and retained placenta as well as the ovarian and uterine problems was done by a specialist veterinary staff at the station. In addition to provide treatment for each case, such as the hormonal treatments and antibiotic and so on.

Four measurements of reproductive performances were used which are; calving interval, days open, rate of conception from first service, and number of services per conception. The statistical analyses were carried out to know the significance statistical differences among groups.

Results and discussion

Table (1): The rates of postpartum problems in dairy cows.

Uterine problems	Ovarian problems	Retained placenta	Dystocia	Normal parturition	Cow number
53%	16 %	26.8 %	69.81 %	30.19 %	386

The above table shows rising in the percentage of dystocia in this station (69.81). This percentage is highly in comparison with the results

of other researches, only if this percentage includes cows that have one parturition which have been scored a high percentage of dystocia (66.5%) (2). the field management and the reproductive care play important role in reducing the ratio of incidence of dystocia in the farm (5).

The same table reveals the increasing of ratio of retained placenta (26.8), compare to 8% recorded in other papers (8), and this may due to high incidence of dystocia which is essential agent in occurrence of placental retention besides to nutritional and management effects (2,7).

The high rate of ovarian and uterine problems is an inevitable result of rising of incidence of dystocia and retained placenta, in addition to both mal nutrition and mal management lead to increase the ratio of ovarian problems which involve inactive ovaries and delayed estrus after parturition.

The table (2) shows us the calving interval for the research cows which was 423.4 days for the first group, and 458.3 days for second group without significant difference between two groups.

The same table also shows the days open for the cows, the days open for first group and second group were 170.1 days, 188.1 days respectively. And without significant difference between these two groups. This result agreed with (12) who confirms that the days open are one of the basic factors that influence the interval between two successive parturitions.

The calving interval for the third group was 427.6 days and 378.8 days for fourth group, with significant difference from the first and second groups at $p < 0.01$ level.

The days open for the third group was 156.7 days, and 101.8 days for fourth group, and without significant difference. these results of both calving interval and days open for the late groups were below the level recommended by (11).

The number of services for conception was 2.3 for the first group, 2.28 for second group and without significant difference between these groups, while the number of services per conception was 2.15, 1.76 for the third and fourth group respectively and with significant difference from the first and second group at $p < 0.01$ level. And this is confirmed by (15) who revealed that the number of services per conception is lesser in older cows than in the younger. And less than expected in other studies (2).

The conception rate from first service was 27.4% for the first group and 25.3% for second group and without significance difference between them. while the conception rate from the first service was 37%, 49% for the third and fourth group respectively and with significant difference from the first and second group at $p < 0.01$ level. These results are in agreement with (17) who said that the multi births cows have higher conception rates than the cows with less number of births.

Table (2): some of measurements of reproductive performance depending on No. of parturitions.

Conception rate from first service	Number of services per conception	Days open	Calving interval	Number of cows	Number of parturitions
%27.4 _a	2.3 _a	170.1 _a	423.7 _a	121 _a	2
%25.3 _a	2.28 _a	188.1 _a	458.3 _a	106 _a	3
%37 ^b	2.15 ^b	156.1 ^b	427.6 ^b	120 ^b	4
%49 ^b	1.76 ^b	107.6 ^b	378.8 ^b	58 ^b	5

Different letters indicate significant difference at $p < 0.01$.

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