

Effect of Progesterone and GnRH treatment on non-functional ovaries in Holstein cows after calving in Babylon province

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ABSTRACT

The study was conducted on (50) Friesian cows age (2.5 -5) years with different nutritional levels, suffering from dysfunction ovary for the period (40-55) days after birth of the year (2019). In the milk cows station (Faiha) / Babylon province. To treat the cases and then follow back to the estrus and use artificial insemination with follow-up pregnancy. The study relied on dietary and hormonal therapy during the open period of adult (110-125) days, cows were divided into two groups (non-functional ovaries and control), which consecutively was divided into three sub groups, including control and treatments.

Hormone therapy must be linked to poor food. Weaknesses or functional delays are not recommended to use hormonal therapy unless the animal's health and nutritional status are improved, as well as the genetic status of the animal dependent on breed selection in terms of nutritional conversion and access to sexual puberty and its ability to maintain the balance of energy is the most important thing that makes the animal in the normal situation in terms of production during his life. Progesterone and GnRH therapy also play a role in the reactivation of ovaries in cases of delayed and hostile. Functional delays are also easier to treat, which is done by dietary improvement only and may not need hormone therapy, especially after adjusting the nutritional status in particular. We conclude from this study that the nutrition improvement before and after birth and improve the quality is the most important things in the management and breeding of animals and during their life cycle before puberty and focus on the postpartum period to restore the animal to its normal functional activity.

Keywords: Progesterone, GnRH, Ovaries, Cows, Calving.

1.INTRODUCTION

Most of the discussions about reduced production in milk cows have focused on milk production and its effect on reproductive performance and reproduction. The effect of nutrition on reproduction in modern times is similar to those reported by ancient societies. Generally cows that suffer from poor health or weight loss will suffer poor reproductive performance. The reason for this relationship is often explained by the initial nutritional needs. One of the priority needs of cows after birth is energy, such as the production of milk and then try to restore the body to obtain and maintain (fat tissue) to provide energy [1].

These needs are immediate and necessary in the process of reproduction and delivery (perhaps considered unnecessary to the individual but noticeably important role for the species), mechanisms to maintain the controls of feeding cow after the birth is of great importance. Therefore, dairy cows carry and give birth once a year and go through a stage of drying, which is important for breastfeeding after birth. The energy required for ovulation of the follicle, formation of the luteal body and the maintenance of early pregnancy are insignificant compared to other energy needs of dairy cows. Therefore, the biologists working in the breeding and reproduction biology of the animal want early pregnancy as long as it needs less energy than the energy required in pregnancy. The effect of nutrition and breastfeeding on reproduction has long been recognized. Ancient societies were well aware of the effects of nutrition as well as milking on reproduction. Aristotle (384-322 BC) wrote that nutrition is the most important environmental factor controlling fertility [2,3].

It was observed through the study that there are cases of delayed and guest ovarian in which the ovary is inactive and guest without change in size and weight, and cases of ovarian inactivity. The incidence of inactivity of the ovaries is related to a lack of functional structures related to the sexual cycle of the ovary leading to the occurrence of non-estrous. The ovaries are small, flat and smooth through the rectal examination and in some cases be rounded, several studies have noticed that it is common early after birth so it can be observed. The condition in the early and causes a decline in reproductive efficiency, which leads to an increase in economic losses, adding to the length of the period between puberty and the first pregnancy that
requires the expenses to get the animal to the stage of production [3], in various farm animals have the occurrence of idle ovaries levels. This depends on the environmental factors and the nutritional and health status of the animal, including lameness and can include calves before puberty and after puberty. delayed puberty can be observed as a result of the following factors: nutritional deficiency, pathogenesis, weight loss, and climatic and environmental conditions [3-6]. which stated that severe nutritional deficiencies in nutrition with the loss of reserve energy of the body causes the lack of the estrous cycle and the animal becomes with no estrous [7]. that decreases cause the follicle does not reach the maximum diameter and lack mature follicle and this is called functional Ovarian disorder and does not contain ovarian activity, which occurs after premature birth and associated with environmental conditions, nutrition and stress. [8] concentrated on health factors, including lameness that the treatment of lameness causes improvement of ovarian function in rate 71% [9]. Therefore, the study aims to follow up the cases of delayed activity of ovarian cows which birth during the open period to find out their reasons and justify and put effective treatment to reach a way to prevent these cases affecting the economy through the decline of production and increase expenses. To identify cases of functional delays of the ovaries.

2. Materials and methods
This study consisted of (50) cows of a Friesian type at the age of (2.5 - 5) years with different health and nutritional levels elected after the birth period (40 - 55) days and the study was conducted within the open period (100 - 120) days.

1. The cows were divided according to the cases into two groups, the first included cases suffering from delayed ovarian activity (40) cows, divided according to treatment into three sub groups (A, B, C), (A) were subjected to GnRH treatment and included (10) cows . (B) group of progesterone therapy with GnRH and included (10) cows . (C) group of nutritional improvement therapy and included (20) cows. Then the control group that included (10) cows did not receive any treatment.

2. GnRH treatment, inject 100 pg (2 ml *) i/m.

3. Progesterone + GnRH treatment, using vaginal sponges containing progesterone at a dose of 50 mg (MAP) for (11) days after lifting the sponges and injecting GnRH at a dose of (100) picograms or (2 ml) i/m .

4. A routine clinical examination was performed to diagnose cases and determine the functional status of the ovary. As for the nutritional improvement, the amount provided for the animals treated with the nutritional improvement was doubled and its quality was increased by adding feed additives such as minerals and vitamins.

5. The cows were observed to reveal the estrous and artificial insemination was used for conception.

6. Estrous appearance after the hormonal injection for a period of (2-3) days for the cases that responded to the hormonal treatment.

7. Estrous appearance, with respect to food improvement treatment and according to his health condition and successively within the period (22-25) days.

8. The cows examined which treated and cerviced after (60) days of insemination.

3. Experimental design
* fertagyl is obtainable in a concentration of 43 µg/mL. suitable for administration. fertagyl is supplied in multi dose vials containing 20 mL of sterile solution manufactured for: intervet inc., millsboro, de19966by: intervet international GmbH, unterschleissheim – Germany.

Table 1. Show the total number of cows divided in two groups and the treatments.

| Total number (50) |
|------------------|
| Group (1) Control (10) |
| Without treatment |
| Group (2) Delayed estrous (40) |
| subgroup treatment |
| Nutrition improvement |
| Progesterone + GnRH |
| (20) C |
| GnRH |
| (10) B |
| (10) A |

Table 2. Show the treatment and the numbers of the estrous cows and pregnant and its percentages after treatment.

| Total number (50) |
|------------------|
| Control (10) |
| Divided into two group |
| without treatment |
| Pregnancy |
| Delayed estrous (40) |
| treatment groups |
mechanism and the metabolism shown by researchers [8-12], who emphasized the relationship of this to insulin and the nutritional improvement was significantly and significantly more than 1% as it is clear that this has to do with nutritional severe nutritional level deficiency before and after birth. As it is clear from the table that the response to treatment with bacterial pathological conditions that result from injuries during and after birth even though it also has to do with a to nutritional and environmental causes and the health condition associated with movement such as lameness also has to do with nutritional factors [3-9]. Therefore, the study agrees with the researchers that the cases of delayed ovarian function are related to nutritional status of the animal when hormonal treatment with GnRH. The researchers stated that the reasons for the occurrence of delayed fertility are due to the delay in ovulation as a result of functional disturbance related to environmental and nutritional factors, which is due to pathological bacterial infections associated with events at birth and beyond such as dystocia and retention of the placenta added to environmental and nutritional factors [3-9]. Therefore, the study agrees with the researchers that the cases of delayed ovarian function are related to nutritional and environmental causes and the health condition associated with movement such as lameness also has to do with pathological conditions that result from injuries during and after birth even though it also has to do with a severe nutritional level deficiency before and after birth. As it is clear from the table that the response to treatment with nutritional improvement was significantly and significantly more than 1% as it is clear that this has to do with nutritional mechanism and the metabolism shown by researchers [8-12], who emphasized the relationship of this to insulin and the growth factor is similar Insulin (IGF-I, Insulin Like growth factor) and their decrease as a result of reduced nutrition, as they have a direct effect on the ovary leading to a decrease in follicular function. It was not known that follicle cells in cows late in delay estrous were affected by insulin or insulin-like growth factor despite the presence of a protein binding factor in the follicle for its actions. [13], confirms that the functional disturbance of the ovary, which has high proportions in reducing animal productivity, result from food imbalance, lack of green fodder, heat stress and high humidity. With the high milk yield and the lack of food intake negatively affects the activity of the pituitary gland, which becomes unresponsive to GnRH after birth, so the results of the research schedule agreed with the researchers [9,10,13] where the table shows a high rate of estrous and pregnancy rates in groups that were subjected to improvement therapy. Therefore, hormonal treatment should be supported by food therapy confirmed by many researchers, such as [10-15]. The higher production in milk accompanied by the release of prolactin, and this means a decrease in the inhibiting factor of the release of prolactin, which causes the inhibition of GnRH release. The treatment with GnRH may help stimulate the ovaries, provided that it is parallel with the nutritional impulse, and this is what I agree with [10], who mentioned the necessity of improving the nutritional status of the animal when hormonal treatment with GnRH. Researchers have clarified the physiology of postpartum events in milk cows and stated that there is a need to think mainly about the relationship between nutrition and reproduction after the birth of cows and to discuss its basic components. The placenta of the ruminants produces abundant amounts of steroids (progesterone and estrogen, and their derivatives) during the last period of pregnancy, and steroids in late pregnancy have an inhibitory effect on the reproductive hormones produced or released from the hypothalamus and pituitary gland. Thus, the first stage of the postpartum reproductive period is to restore

### Table No. (1)

|   | C | B | A | C | B | A** | N.I. | P+G | G* |
|---|---|---|---|---|---|-----|-----|-----|----|
| n | 15 | (5) | (5) | 17 | (5) | 6 | (20) | B(10) | A(10) |
| % | 88% | 100% | 83% | 85% | 50% | 60% |

Symbols : G = GnRH  
P + G = Progesterone + GnRH  
N. I . = Nutritional Improvement

### 4. Results

Table No. (1) shows that the number of animals that were in estrous cycle after treatment with food support of group (C) and as a case of delay estrous was (17) and percentage (85%), and the number of pregnant cows was (15) and a rate of (88%). The table also shows that the number of cows which were in estrous cycle and pregnant after treatment with GnRH and inseminated in group (A) of estrous case were (6) and a rate of (60%) and pregnant cows (5) and a rate of (83%), while group (B) when treatment with progesterone And GnRH was with estrous cows (5),and a rate of (50%), and the number of pregnant cows (5), and a rate of (100%). while the control group, the number of dairy cows were (3), at a rate of (30%), and the number of pregnant cows (2), at a rate of (66%). The results were within the open period of (100-120) days. It was clear from the statistical analysis based on the Ki square that the results of the nutritional improvement were significant P <0.01 of another groups, the delay estrous case (first case followed by group A) where the significance of P was greater or equal to the of significance control and group (B), the calculated result of the Ki square It was (18.212) and tabular was (12.16). Either the results of the statistical analysis of pregnancy, the Ki square of the first group was (8.25). Thus P was non-significant at 5%. Statistical analysis was calculated on the basis of the Chi-square according to reference of Statistics Principles - Khashea Al-Rawi, 2000.

### 5. Discussion

The researchers stated that the reasons for the occurrence of delayed fertility are due to the delay in ovulation as a result of functional disturbance related to environmental and nutritional factors, which is due to pathological bacterial infections associated with events at birth and beyond such as dystocia and retention of the placenta added to environmental and nutritional factors [3-9]. Therefore, the study agrees with the researchers that the cases of delayed ovarian function are related to nutritional and environmental causes and the health condition associated with movement such as lameness also has to do with bacterial pathological conditions that result from injuries during and after birth even though it also has to do with a severe nutritional level deficiency before and after birth. As it is clear from the table that the response to treatment with nutritional improvement was significantly and significantly more than 1% as it is clear that this has to do with nutritional mechanism and the metabolism shown by researchers [8-12], who emphasized the relationship of this to insulin and the growth factor is similar Insulin (IGF-I, Insulin Like growth factor) and their decrease as a result of reduced nutrition, as they have a direct effect on the ovary leading to a decrease in follicular function. It was not known that follicle cells in cows late in delay estrous were affected by insulin or insulin-like growth factor despite the presence of a protein binding factor in the follicle for its actions. [13], confirms that the functional disturbance of the ovary, which has high proportions in reducing animal productivity, result from food imbalance, lack of green fodder, heat stress and high humidity. With the high milk yield and the lack of food intake negatively affects the activity of the pituitary gland, which becomes unresponsive to GnRH after birth, so the results of the research schedule agreed with the researchers [9,10,13] where the table shows a high rate of estrous and pregnancy rates in groups that were subjected to improvement therapy. Therefore, hormonal treatment should be supported by food therapy confirmed by many researchers, such as [10-15]. The higher production in milk accompanied by the release of prolactin, and this means a decrease in the inhibiting factor of the release of prolactin, which causes the inhibition of GnRH release. The treatment with GnRH may help stimulate the ovaries, provided that it is parallel with the nutritional impulse, and this is what I agree with [10], who mentioned the necessity of improving the nutritional status of the animal when hormonal treatment with GnRH. Researchers have clarified the physiology of postpartum events in milk cows and stated that there is a need to think mainly about the relationship between nutrition and reproduction after the birth of cows and to discuss its basic components. The placenta of the ruminants produces abundant amounts of steroids (progesterone and estrogen, and their derivatives) during the last period of pregnancy, and steroids in late pregnancy have an inhibitory effect on the reproductive hormones produced or released from the hypothalamus and pituitary gland. Thus, the first stage of the postpartum reproductive period is to restore
the activity of the hypothalamus and pituitary glands from the effects of the previous pregnancy and the resumption of secretions of the amounts of the hormone FSH and LH. and the LH mechanism must be re-increased to increase ovulation [14,15]. The first stage of after birth is relatively short and normal LH pulses begin in one to two weeks after birth, and thus the LH mechanism returns with a short period and there is a variety of factors that affect the resumption of LH hormones (most notably energy balance) and the effect is relatively dependent on the intensity of these factors. FSH needs follicular growth after the birth of cows, but it is not seen as a stage of reproduction or ovulation. In fact, most cases of non-breeding cows are the result of relatively high FSH concentrations. The second stage of the postpartum reproductive process is uterine involution after birth. The uterus recedes quickly and is completed 30 to 40 days after birth. The completion of the involution coincides with the completion of the postpartum fertility stage for the cows. Consequently, most followers of the involution considered it as the first point for the beginning of the animal’s fertility return and the period 40-80 days is considered the completion period. Therefore, it is possible that the basis for fertility is not considered to be the existence of this period and is supposed to be shrink it [16]. The area that has been heavily focused on is the ovaries and their recovery for postpartum reproduction. Follicular development occurs during pregnancy, but the follicular diameter may be cut short due to a decrease in LH impulses during the last stage of pregnancy in cows (due to the high steroids in this period as previously mentioned). Follicular development begins with a short period after birth with the transitional increase of FSH and the occurrence of a follicular wave until it is or evolution to the mature follicle and in a short time the first mature follicle after birth is under one of three facts(1) ovulation (2) atresia and rotation (followed by the appearance of a new wave) . (3) Cyst formation . Reproductive biologists have paid great attention to the events of these three mechanisms. The main component of these events is the secretion of the L.H. during the first postpartum period. Changes in vital metabolism hormones in cows after birth, and reflect the metabolic transformation in the animal. Growth factor like -insulin concentrations, insulin and lipid in the blood shortly after birth [15-20] . Insulin and GF-like -insulin concentrations increase gradually after birth while the fat or leptin is still low in dairy cows. Insulin-like, insulin and leptin are providers of positive energy balance. Thus, the cows in the negative energy balance, the concentrations of these substances are low. The secretion of LH and FSH is controlled by GnRH from the hypothalamus and the previously mentioned endocrine system is dominated on the secretion of GnRH. The secretion and action of GnRH can be either under a neurological effect or by its effect on the pituitary gland directly through the hypothalamus axis - the frontal lobe of the pituitary gland [21,22]. Therefore, this study recommends the need to support and pay attention to the period before and after the birth, the necessity of providing adequate nutritional support for each stage, accurate diagnosis of the state of delayed ovarian ovulation, from routine examination of cows, follow-up of estrus and coordination between food and what the production stage requires in an accurate and scientific manner, and hormonal treatment is not sufficient as it must be depend on nutritional improvement, as is the need for continued research to find out the nutritional quantities necessary for each stage of animal production.

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