

Reproductive performance improvement in primiparous lactating Holstein cows by different hormonal treatments

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(Received January 10, 2012; Accepted June 13, 2012)

Abstract

This study was aimed to evaluate different hormonal treatments during early postpartum period on reproductive efficiency on 42 primiparous Holstein cows in the experimental farm of college of Agriculture, University of Baghdad, aged 3-3.2 y. during the period from 2010-2012. These cows were divided randomly into four groups according to hormonal treatment at day 50 postpartum. The 1st group included 11 cows and was injected with GnRH 0.0126mg/IM, the 2nd group (10 cows) injected with eCG 1000 IU/IM, the 3rd group (11 cows) administrated by hCG 1500 IU/IM and the 4th group (10 cows) without treatment as a control group. The results of this study revealed that the responsive cows (estrus behaviors) were 10 (90.9%), 8 (80%), 9 (81.8%) and 9 (90%) in the 1st, 2nd, 3rd and 4th group respectively and these results were recorded superior significant ($P<0.01$) for group 2 compared with group 1 and 3 related with duration from initiation of estrus, but no significant differences ($P<0.01$) between all groups about services per conception and number of conceived animal while the days open and calving interval was recorded significant differences ($P<0.01$) between the 1st, 2nd and 3rd groups compared with control group (4th group). It could be concluded that using hormonal treatment which indicated to produce improvement in certain parameters of reproductive performance provided early post partum breeding.

Keywords: Holstein, Reproductive performance, GnRH, hCG, eCG.

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تحسين الأداء التناسلي في أبقار الهولشتاين الحلوب احادية الولادة بعلاجات هرمونية مختلفة

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الخلاصة

لقد استهدفت الدراسة تأثير استخدام انظمة علاجية هرمونية مختلفة خلال الفترة المبكرة بعد الولادة على الكفاءة التناسلية على ٤٢ بقرة هولشتاين حلوب احادية الولادة في الحقل الحيواني التجريبي التابع لكلية الزراعة/ جامعة بغداد وتراوحت اعمارها بين ٣-٣,٢ سنة وذلك خلال الفترة من ٢٠١٠-٢٠١٢. وقد قسمت هذه الابقار عشوائيا الى اربعة مجاميع طبقا لنوع التعامل الهرموني لها. وضمت المجموعة الاولى ١١ بقرة وقد حقنت بهرمون ال GnRH وجرعة ٠,٠١٢٦ ملغم في العضلة أما المجموعة الثانية (١٠ أبقار) فتم حقنها ب ١٠٠٠ وحدة دولية من هرمون eCG فيما حقنت المجموعة الثالثة ب ١٥٠٠ وحدة دولية من هرمون hCG وكان عددها ١١ بقرة، أما المجموعة الرابعة والتي مثلت مجموعة السيطرة فقد ضمت ١٠ أبقار ولم تتم معاملتها بأي معاملة هرمونية. كانت نسب الاستجابة (ظهور الصراف) للعلاج ٩٠,٩%، ٨٠%، و ٨١,٨% للمجاميع الأولى والثانية والثالثة على التوالي بينما أظهر الشيق بنسبة ٩٠% بالنسبة للمجموعة الرابعة ولكن بعد فترة ٤٨ يوم من بدء المعاملة للمجاميع الأخرى، أما فترة الاستجابة فكانت قد سجلت فارق معنوي بمستوى ($P<0.01$) لصالح المجموعة الثانية مقارنة مع المجاميع الأخرى وكذلك اتضح الفارق الكبير بين المجاميع المعاملة هرمونيا مع مجموعة السيطرة. أما المقاييس التناسلية الأخرى فقد حصلنا على عدم وجود فارق معنوي بين المجاميع فيما يخص عدد التلقيحات اللازمة للحمل ولكن سجل فارق معنوي بمستوى ($P<0.01$) لصالح المجاميع الثلاثة الأولى مقارنة مع مجموعة السيطرة وعليه فقد تم الاستنتاج من هذه الدراسة بأنه يمكن تحسين الاداء التناسلي لهذه الابقار وبفترة مبكرة باستخدام معاملات هرمونية عما عليه لو تركت بدون تدخل.

Introduction

The reproductive performance of a dairy herd has a significant effect on the profitability of that herd (1,2). Common measures of reproductive performance are days to the first postpartum estrus, services per conception, conception rate, days open and calving interval (3-5). Many factors affect the interval from parturition to first estrus and conception at the time of breeding include energy balance, milk production and greater milk production in modern cows has lead to reduce conception rate and a greater demand for new tools to manage reproduction, uterine infection, ovarian diseases and endocrine responses (5-7). Many authors reported that the administration of hormones included eCG, GnRH, Progesterone or hCG during the early postpartum period has increased early ovulation, but the effect on the interval from calving to conception has been variable (8-10).

Reproductive efficiency of dairy cows is influenced by different factors including genetic, season, age, production system, nutrition, management, environment and diseases (8, 11, 12 and 13). The aims of this study were to evaluating different hormonal treatments during early postpartum period upon the reproductive efficiency criteria and to determine the effects of treatments upon the first post partum estrus, services per conception, pregnancy rate, days open and calving interval.

Materials and methods

This study was conducted on 42 primiparous Holstein cows in the farm of the college of Agriculture/ University of Baghdad. These animals treated with different hormonal regimes at day 50 of postpartum period according to their parturient dates during the period from 2010-1012, their ages 3-3.2 years. The cows were divided randomly into 4 groups, 1st group included 11 cows injected with GnRH

(Receptal) (Intervet international B.V. Boxmeer, Holland) 0.0126 mg (3 ml) IM in one dose at day 50 after parturition, 2nd group (10 cows) injected with eCG (Serigan) (Laboratories ovejero, S.A. Leon-Spain) 1000 IU/IM in one dose, 3rd group (11 cows) administrated by hCG (I.V.F-C) (Yougie-dong, Iksan-si, Jonbuk-do, Korea) 1500 IU/IM in one dose also and 4th group (10 cows) without treatment and they considered as a control group. The number of responsive cows, duration of response, services per conception, number of conceived animals, days open and calving interval were recorded as well as nature of parturition and viability of calves. Statistical analysis included mean, standard error; Qi-sequare and F-test were used according to Steel and Torrie (14).

Results

The results were revealed in table (1) represented the type of treatment and response to their treatment, responsive cows were 90.9%, 80%, 81.8% and 90% in the 1st, 2nd, 3rd and 4th groups respectively. While the duration from treatment tills the initiating estrus behavior was 5.62±1.02, 3.24±0.96, 6.32±1.48 and 98.35±19.76 days in the 1st, 2nd, 3rd and 4th groups respectively. Table (2) revealed the number of services per conception, number of conceived animals, days open and calving interval. These reproductive parameters were recorded no significant differences (P<0.01) between all groups about number of services per conception and number of conceived animal while the days open and calving interval was recorded significant differences (P<0.01) between the 1st, 2nd and 3rd groups compared with 4th group, but the nature of parturition showed that the dystocial parturition (due to many causes) recorded 13.89% compared with normal 86.11% (table 2) while the viability of calves were 94.41% for alive calves and 5.6% for dead calves.

Table 1: show the type of treatment, responsive animals and duration of responsiveness in Holstein cows.

Groups	No. of Animals	Type of treatment	Responsive animals (Estrus behavior) No. %	Duration of responsiveness (days) M±SD
G1	11	GnRH 0.0126 mg IM	10 91.9% a	5.62±1.02 a
G2	10	eCG 1000 IU/IM	8 80% b	3.24±0.96 b
G3	11	HCG 1500 IU/IM	9 81.8% b	6.32±1.48 a
G4	10	Without treatment	9 90% a	98.35±19.76 c
Total	42	----	36/42 85.71%	----

N.B. All animals treated after 50 days from calving.

Discussion

The results showed that the responsive cows in group one which injected with 0.0126 mg of Receptal were recorded superior significant differences (P<0.01)

compared with group 2 and 3. Also the groups 1, 2 and 3 recorded highly superiority (P<0.01) compared with group 4 (8,9,14) and similar observation have been made by (10,11,13). While the duration between initiating of treatment to induction of estrous was significantly higher

($P < 0.01$) in group 2 compared with group 1, 3 and 4 and these results agree with (10,11,15). There is no significant difference between the results of the services per conception all groups as showed in table 2, while the days open and calving interval were recorded superior significant differences ($P < 0.01$) between group 1, 2 and 3 compared with control group. These results were agree with (3,4,6) and reported by many authors (2,9,14,16). The ratio of

dystocial parturitions were recorded 13.89% in all groups as well as they recorded 94.4% which represented alive calves and 5.6% for dead calves, these results were agree with (6,8,10,17,18). It was concluded that the using of many hormonal regimes in early postpartum period which indicated to reduce the period for 1st postpartum estrus, number of services per consumption, days open and calving interval.

Table (2): Show the reproductive measurements, nature and viability of calves in Holstein cows.

Group	No. of Animals	Services per Conception	No. of Conceived Animals	Days Open M±SE	Calving Interval M±SE	Nature of Parturition		Viability of calve	
						N	D	A	D
G1	10	1.62±0.41 a	10	83.4±6.27 a	365.7±5.75 a	8	2	10	0
G2	8	1.73±0.53 b	8	87.3±8.38 a	371.5±6.65 a	7	1	8	0
G3	9	1.81±0.49 a	9	86.2±7.14 a	370.8±7.39 a	8	1	9	0
G4	9	1.87±0.63 a	9	148.6±16.34 b	434.3±10.48 b	8	1	7	2
Total	36	-----	36	-----	-----	31/36	5/36	34/36	2/36

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