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## THE USE OF GNRH ANALOGUE FOR TREATMENT OF OVARIAN INACTIVITY IN COWS AND BUFFALOES

(With one Table)

By

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### استخدام نظير GNRH فى علاج خمول المبايض فى الأبقار والجاموس

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تضمن البحث محاولة استخدام عقار الفيرتاجيل ( نظير GNRH ) فى علاج خمول المبايض فى خمس بقرات جيرسى وخمس جاموسات كانت تعاني من عدم الشيع لفترة طويلة بعد الولادة وبلا تركيبات دورية بمناسله. وقد تم اعطاء كل بقرة ٢٥ ميكروجرام وكل جاموسة ٥٠٠ ميكروجرام من عقار الفيرتاجيل كجرعة واحدة عن طريق الحقن بالعضل. وأسفر هذا عن ظهور أعراض الشبق على أربعة بقرات وجاموستين بعد ٧٢ ساعة من حقن العقار ، وبالنسبة لباقي الحيوانات التى تم علاجها فقد ظهرت أعراض الشبق على البقرة الخامسة وواحدة من الجاموس بعد ٢٥ يوماً من الحقن بينما لم تظهر هذه الاعراض على الجاموستين المتبقيتين على الرغم من وجود جريب من مبيض احدهما. وقد تم تلقيح الحيوانات التى أظهرت أعراض الشبق طبيعياً باستخدام طلائق خصبه وأسفر الفحص عن طريق المستقيم بعد مضي ستة أسابيع على التلقيح أن الخمس بقرات الجيرسى وثلاث جاموسات كانت عشاراً.

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## SUMMARY

The use of GnRH-analogue (Fertagyl) for treatment of ovarian inactivity was tried in 5 Jersey cows and 5 buffalo-cows having long acyclic post-partum period and with no structures in their gonads. Each cow was given 250 ug of GnRH analogue and each buffalo-cow was given 500 ug of the drug, as a single dose, by the intramuscular route of injection. Signs of estrus were exhibited by 4 of the cows and 2 of the buffaloes, 72 hours after treatment. The remaining cow and one of the buffaloes came in heat 25 days after treatment but the other 2 buffalo-cows did not show signs of estrus, however, one of them had a palpable follicle in her ovaries. All cows who came in heat were naturally mated by fertile bulls and rectal examination, 6 weeks later, revealed that the 5 Jersey cows and 3 out of the 5 buffalo-cows were pregnant.

## INTRODUCTION

Parturition is usually followed by a period of ovarian inactivity and sexual quiescence before reproductive cycle recommence. The length of this interval is variable and can be affected by many factors, such as milk yield, suckling, nutrition, season and hormonal status of the animal (PETERS and BALL, 1987). They added that the availability of hormonal therapy that would overcome acyclicity or true anoestrus, irrespective of the primary cause, would be of great advantage for correction of such cases. QAYUM *et al.* (1991) revealed that Gonadotrophin releasing hormone (GnRH) is a decapeptide released by the hypothalamus. The binding of the peptide to pituitary receptors leads to the activation of the second messenger systems and the physiological outcome of the exposure of pituitary cells to GnRH is the release of luteinising hormone (LH) and follicle-stimulating hormone (FSH). They added that this action of GnRH on the pituitary defines its therapeutic possibilities.

HAFEZ (1953) reported that ovulation was induced in buffaloes after treatment with gonadotrophins. EL-GHANDOUR (1981) injected two successive doses of GnRH for stimulation of inactive ovaries in buffalo-cows. A single dose of 10-12 ug/cow of GnRH analogue was successfully used by ABOUL-ELA *et al.* (1985) to eliminate ovarian inactivity in post-partum milking cows. JAGGER *et al.* (1987) recorded that GnRH was used at a



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dose of 48-240 ug/cow to enhance ovarian activity throughout the post-partum period in suckling cows. BARKAWI and ABOUL-ELA (1989) studied the post-partum response of suckling buffaloes to treatment with GnRH analogue at a dose of 12 ug/animal. GRAVES *et al.* (1990) evaluated the effect of GnRH at various injection sites on third service conception rate among Holstein cows (100 ug/cow) at the time of breeding. They recorded conception rates of 38%, 50% and 32% for intramuscular, subcutaneous and intravenous routes of injection, respectively.

The present work was carried out to evaluate the effect of GnRH analogue (Fertagyl) for treatment of ovarian inactivity in cows and buffalo-cows.

### MATERIAL and METHODS

Five Jersey cows and 5 buffalo-cows were used in this work. Those animals were selected on the basis that they were having prolonged acyclic post-partum period, which ranged from 3 to 8 months. This was confirmed by rectal examination, twice a week, for 4 successive weeks before treatment of animals. The animals were kept in 2 separate open stalls at the Farm of Faculty of Agriculture, Assiut University. They were proved to be free from external and internal parasites by both clinical and laboratory examinations. A concentrate mixture and rice straw were offered to the animals according to their body weight and milk production and green clover was offered whenever available. Moreover, the animals were given a free access to drinking water. Each cow was given a single dose of 250 ug GnRH analogue (Fertagyl), a product of Intervet International, while each buffalo-cow was given a dose of 500 ug from the same drug by the intramuscular route of injection, all animals were kept under close observation and they were subjected to rectal examination every other day following GnRH injection for detection of ovarian structures. Moreover, they were teased twice daily using fertile bulls up to 25 days after treatment and cows in estrus were naturally mated by those bulls. Mated cows and buffalo-cows were rectally examined, 6 weeks later, for pregnancy diagnosis.

### RESULTS

The results of treatment of the non-cyclic Jersey cows and buffalo-cows with Fertagyl (GnRH-analogue), including both the observed estrus and the final rate of pregnancy, are presented in table (1). Four out of the 5 Jersey cows and 2 out of the 5 buffalo-cows expressed signs of estrus 72 hours after injection with Fertagyl and they were naturally-mated. The remaining cow and one of the 3 buffalo -cows exhibited estrus 25 days after



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treatment but the other 2 buffaloes did not show estrus, however one of them had a palpable follicle in her ovaries. Rectal examination, 6 weeks after mating, revealed that the 5 Jersey cows and 3 of the buffalo-cows were pregnant.

Table 1: Results of treatment of the non-cyclic cows and buffaloes with GnRH analogue

Animal	Number	Dose of GnRH	Observed estrus		Final rate of pregnancy
			After 72h	After 25 d	
Jersey cows	5	250 ug	4	1	5/5
Buffalo-cows	5	500 ug	2	1	3/5

## DISCUSSION

A major cause of anestrus in cows is associated with prolonged post-partum intervals that constitute a high economic loss to dairy industry (HOPKINS, 1989). The regular post-partum gynaecological care would results in significant reductions in the calving to conception interval, the insemination index and in the percentage of cows culled due to fertility problems (BOSTEDT and MAURER, 1990). They added that administration of GnRH to cows with problems in the post-partum period and under continuous gynaecological supervision resulted in improvements in some aspects of reproductive performance of these animals. The obtained results in the present work, including resumption of estrus and occurrence of pregnancy in the non-cyclic cows and buffalo-cows, following treatment with Fertagyl (GnRH-analogue) together with the intensive gynaecological care are in accordance with the above mentioned results of BOSTEDT and MAURER (1990). Moreover, NASIR *et al.* (1990) injected dairy buffaloes with GnRH on day 14 post-partum (100 ug or 250 ug/animal). They revealed that this was resulted in quicker completion of uterine involution, earlier resumption of ovarian activity, shorter intervals between calving and conception and a better first service conception rate in non-suckled dairy buffaloes.

On the other hand, PETERS and BALL (1987) reported that there have been many attempts to induce ovulation in post-partum cows by single intramuscular injections of 100-500 ug GnRH and these have given variable results. They added that LH-release of preovulatory surge magnitude usually occurs depending on the responsiveness of pituitary and it will induce ovulation of an already developed follicle or alternatively it might result in premature luteinization of an unovulated



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follicle. This may give an explanation of failure of exhibition of external signs of heat by one of the buffalo-cows inspite of having a palpable follicle in her ovaries. Similar findings were also observed by RETTMER *et al.* (1992) who recorded changes in follicles (toward luteinization) following injection of GnRH agonist (Fertirelin acetate). Moreover, FOSTER *et al.* (1980) revealed the effect of GnRH injection in post-partum dairy cows on plasma concentrations of LH, FSH and progesterone. IRELAND and ROCHE (1983) recorded the development of non-ovulatory antral follicles, changes in steroids and receptors following gonadotropin injection.

Therefore, it can be concluded that GnRH analogues can be used successfully for induction of estrus in problem cows and buffalo-cows during prolonged post-partum period and this must be accompanied by close and continuous gynaecological care. Moreover, the dose level of GnRH analogues should be determined according to the instructions of the manufacturer. The used dose of Fertagyl in the present work was detected by Intervet International as F.S.H. level in the serum of injected animals is linear up to a dose of 500 ug of the drug.

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