Comparison of two methods estrus synchronization by CIDR and sponge along with PMSG various levels on Baloochi ewes on reproductive performance in breeding season

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Abstract: The aim of the present study is to compare two estrus synchronization by CIDR and sponge on ewes along with PMSG various amounts in reproduction season. 56 Baloochi breed ewes (45.8 ± 1.3 kg of BW) were divided into two experimental groups. In first experiment, 28 heads of ewes were divided into four groups (n=7/in each group).Estrus synchronization ewes group received CIDR for 14 days. During CIDR exit, four groups received 1 milliliter normal saline serum, 150ml, 300ml, and 450ml international PMSG unit for the first, second, third and fourth group by injection respectively. In the second experiment sponge was used instead of CIDR. 40 hours after injection of PMSG, 6 rams entered the flock. The observed results in the first and second experiment showed that the rates of multiparous, multiple birth and lambing in those groups which received 450 unit PMSG were higher than the other groups ($p<0.05$). There was not any significant difference between both groups in estrus synchronization ($p<0.05$). These results suggest that 450 IU PMSG was more effective in increasing Multi birth rate in the Baloochi ewes in breeding season.

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1. Introduction

Estrus synchronization on live stock can be developed by treatments in the stage of corpus luteum or folicolization of estrus cycle. Estrus synchronization in considered one of important instrument for ewes reproduction management improvement (Evans and Maxwell, 1990; King et al., 2004). Ovulation enhancement by using hormones is one of the suitable methods for improving reproduction potential capability. Because a ewe ovarium has several hundred thousands ovules in the time of giving birth and if it gives birth for 25 times during his life, less than 1/8000 of them will be reduced (Gonzalez et al; 2005). At first Robinson explained how to use both naturally intra -vaginal or artificial progesterone combinations along with gonadotropin for ewes mating, and then it has been applied in a great extant in commercial research herds. One of the methods in which progesterone is slowly being absorbed by mucous membranes, is inter-vaginal pessaries like CIDR which contains progesterone.Intra-vaginal sponge smeared with FGA or Medroxy progesterone stat. (MPA) is used for estrus synchronization on ewes. (Dogan, et al; 2008.) releasing progesterone from CIDR and sponge is reduced in a long period.So, providing high density progesterone in a short period (5t. 8days) is effective during reproduction season for estrus synchronization. The conducted studies on using PMSG hormone in various breeds emphasis on multiple birth enhancements (Diskin, et al; 2002). Folicoles growth and attaining to a stage of pre-ovulation is done by FSH hormone, when a folicole matures, it exits a lot of inhibin and estradiol which in turn suppress FSH hormone, and PMSG hormone acts as FSH alternative and increases ovulation in ruminators. (Greyling, et al 2000). PMSG in addition of its effect on estrus synchronization infusion enhancement, it also increase ovulation rate, the aim of this research is to review two estrus synchronization methods by CIDR and sponge in reproduction season and to determine the best dose of PMSG for enhancing super ovulation and creating Multiple births on Baloochi ewes. Estrus synchronization on ewes is used in order to reduce the pregnancy period and also in order to remove the problems in the course of ovulation time and inoculation time. Estrus and ovulation can be done artificially and simultaneously in a live stuck herd, and subsequently in a determined time all of them can be inoculated at once(Godfery, 1997). Synchronization and estrus infusion out of reproduction season creates suitable economical and managerial opportunities for producers.(Simonetti, et al,.2002, Greyling, 1977). Which finally results in lambing enhancement and a better inoculation programming, delivery, nutrition

and other cases? More than half a century CIDR is used as the first option for estrus synchronization.(Jainudeen, 2000). It has been shown that using progesterone can enhance estrus infusion and mating which results in pregnancy and increasing lambing rate on ewes. (Simmonetti, 2000, Vinoles, 2001). Also pregnant mare serum gonadotropin (PMSG) injection after CIDR causes estrus emergence, ovulation rate enhancement, pregnancy rate enhancement and increasing multiple birth and as a result lambing is increased.(Carlson, 1989)

2 Materials and methods:

2.1Animals and Diets

The study was performed in khorasan Province, torbat jam City, during 6 month in Bezd heights located 40 Km from Torbat-e jam located in east of Iran. 56 ewes of Baloochi breed ewes (45.8 ± 1.3 kg of BW) were used in completly randomied for this research.15 days before this study, the ewes were reviewed from body score (physical situation) point of view. ewes diet includes maze range after grazing fodder and daily 400gr constant rate (67%barlcy, barn 20%, oil cake 12%, salt 5%, complementary 5%). During ewes placement in this area, any roofed space was not considered for them and they were in an open space.

2.2 Experimental Procedure

Ewes were divided randomly in 4 subgroups (each subgroup includes 4 ewes).

Table 1: estrus synchronization mean by CIDR Dissimilar words in each column indicates significant difference(p<0.05).

Time interval (hour)					
Period mean	**Estrus percent (hour)**	**Ewes number 52-72**	**Ewes number 40-52**	**Ewes number 24-40**	**Group1**
	52[a]	1	4	2	c-p0
	34[a]	-	-	7	c-p150
	36[a]	-	-	7	c-p300
	35.5[a]	-	-	7	c-p450

c: CIDR p:PMSG

c: CIDR p:PM

Table 2: Estrus synchronization mean by sponge Dissimilar words in each column indicates significant difference(p<0.05).

Time interval (hour)					
Duration mean	**Estrus percent (hour)**	**Ewes number 52-72**	**Ewes number 40-52**	**Ewes number 24-40**	**Group2**
	62[a]	4	2	1	s-p0
	39[a]	-	-	7	s-p150
	38.5[a]	-	-	7	s-p300
	37[a]	-	-	7	s-p450

In the first group CIDR (CIDR Newzeland) containing 0.3g progesterone was used for estrus synchronization for 14 days. During CIDR exit, all the ewes were injected PMSG intramuscularly. The first group 1mililiter normal saline serum, the second group 150, the third group 300and the fourth group 450 international standard PMSG was injected intramuscularly. In the second experiment sponge (choronogest Int was used instead of CIDR for 14 days). The other stages were as the first stage, 24 hours after removing progesterone sources, two ewes were used for detecting estrus ewes. After establishment of ewes in the hard, they were monitored constantly in order to determine the initiation of estrus time which is approved by allowing the ewes to jump. 40 hours after CIDR exit, and PMSG injection, 6 rams entered the herd. In each group reproduction indices as estrus outcome, lambing rate, multiparous rate and multi birth rate were compared and reviewed. For measuring the above – mentioned indices the following formula were used: Oestruse response: number of ewes showing oestrus/total ewes treated in each group×100 (Akoz et al. 2006).

Delivery outcome: the number of mother ewes to the mating ewes (Zamiri. 1998 And Martinez 2006). Lambing rate: the ratio of born lambs to the mating ewes (Zamiri. 1998 And Martinez 2006).

Table 3: reproduction performance result from CIDR And PMSG						
Multiple births rate	**Multi birth rate**	**Lambing rate**	**Delivery outcome**	**Delivery number**	**Mating ewes number**	**Group**
$1/4^{b}$	$0/22^{b}$	$1/4^{b}$	1^{a}	7	7	c-p450
1^{a}	0^{a}	1^{a}	1^{a}	7	7	c-p300
1^{a}	0^{a}	1^{a}	1^{a}	7	7	c-p150
1^{a}	0^{a}	1^{a}	1^{a}	7	7	c-p0

Dissimilar words in each column indicates significant difference($p<0.05$).
c: CIDR p:PMSG

Table 4: reproduction performance result from sponge And PMSG						
Multiple births rate	**Multi birth rate**	**Lambing rate**	**Delivery outcome**	**Delivery number**	**Mating ewes number**	**Group**
$1/14^{b}$	$0/12^{b}$	$1/14^{b}$	1^{b}	7	7	s-p450
$./85^{a}$	0^{a}	$./85^{a}$	$./85^{a}$	7	7	s-p300
$/85^{a}$	0^{a}	$./85^{a}$	$./85^{a}$	7	7	s-p150
$./85^{a}$	0^{a}	$./85^{a}$	$./85^{a}$	7	7	s-p0

Dissimilar words in each column indicates significant difference($p<0.05$).
c: CIDR p: PMSG

Multiple birth rates: number of multiple lambing/total lambing in each group (Akoz et al. 2006). Multi birth rate: the ratio of the number of multi birth ewes to the all born lambs (Zamiri. 1998 And Martinez 2006).

2.3 Statistical Analysis

Data were analyzed using the GLM procedure of SAS (Windows Version Release 8.02, SAS Inst., Inc., Cary, NC). SAS. (2004). The data were compared by using one-way and two – way k-square model. Effect of treatments were declared significant ($P<0.05$).

3. Results and discussion

In this research all the ewes which use PMSG in addition to CIDR and sponge within 24 – 40 hours (tables 1 and 2) after CIDR and sponge exit were rutted which in comparison to those groups which don't receive PMSG don't show any significant difference ($p<0.05$).PMSG enhances estrus for several hours (Dogan, 2008, And Ahmed, 1998.) but any significant difference was not observed in a comparison of estrus time between the second, third and fourth groups (Table 1, 2).

The obtained results show that in in a 24-40 hours time interval after CIDR and sponge exit, the estrus sign was observed in 78 and 75 percent of live stocks respectively, which had not any significant difference, and generally in 24-70 hours time interval,100% of ewes were butted. Godfrey et.al demonstrated that estrus emergence rate after CIDR and sponge during 12 days on woolen breed ewes was 100% and 94/4% in a 36 hours interval after entering the ewes in their herd (Pakoff, 1981) in tables 3 and 4 reproduction performance of the ewes which were treated by CIDR – PMSG and sponge SPMG are shown. Multi birth rate, multiple birth rate and lambing rate in both groups which received 450 international standard PMSG was higher significantly ($p<0.05$).

In current study the ewes in a 24-40 hours time after being injected by PMSG and the exit of CIDR showed esterus symptoms. The progestron rate remains high which the CIDR is in the uterous and yellow mass function fails as soon as the exit of CIDR the yellow mass assimilates and the progesterone rate reduces and this assimilation of the yellow mass duration in the ewe is about 1-2 days, then the sterogen increases and causes the appearance of esterous symptoms (Cardens et al., 2004; Fair et al., 2007; Knights et al., 2001; Thatcher et al., 2002). One of the reasons that all the ewe were esterued simultaneously was that for all the ewes the CIDR was applied for 14 days. Hassini et al. (1998) reported that in the ewes which were cured by PMSG, oviposition rate was high meaningfully and also esterusal rate was sooner about after hours Intravaginal sponges containing 40 mg progestagen were effective in inducing estrus in 70% of the Sudanese Nubian goats (Ahmed *et al.*,1988). Intravaginal sponges containing FGA and CIDR devices were equally effective for the control of ovulation in Cashmere goats when combined with eCG injection (Ritar *et al.*, 1990).Researchers have also tried to determine the optimum dose of cloprostenol for estrous synchronization. Greyling and Van der Westhuysen (1977) found that with 125 µg doses of cloprostenol, only 80% of their ewes came into estrus, as compared with 100% at the 250 µg dose level.Previous experience with the use of CIDR in

ewes, techniques employed in inserting the sponge (Romano., 1998; Nosrati., et al., 2011). Some papers reported that administration of 300 IU PMSG was not sufficient to stimulate additional follicular development or was weak for some breeds response (Koyuncu et al., 2008; Romano., 1996). Twining rate in experiment of Ozbey and Tatli (2001) that synchronized the Awassi ewes for 14 d with sponges containing 40 mg of FGA and superovulated by 500 IU of PMSG injection were 46% that is higher than the result of current study obtained by using 500 IU PMSG. Recently, Progesterone or its analogues is generally used to synchro-nize estrous during the breeding and non-breeding season (Nosrati., et al., 2011; Dogan et al., 2005). Administration of gonadotropins such as human menopausal gonadotropin (hMG) (Evans., 2003), follicle stimulating hormones (FSH) and mixed gonadotropins preparations (Knights et al. 2003) after stopping progestagens treatment, causes in-creasing rate of ovulation.In this experiment with increasing in PMSG dosage the fecun-dity rate was increased. Ince and Karaca (2009) reported 1.33 and 1.39 litter sizes for 400 and 500 IU PMSG in Chio×Kivircik ewes which is similar to this result the observed variation depends on various factors such as breed, age, time and dose of PMSG administration (Dogan ans Nur., 2006; Nosrati., et al., 2011). Salehi et al.,(2010) reported that the different sheep breeds have been identified as a major source of variation in the superovula-tory response.

Conclusions

These results suggest that 450 I.U. PMSG was more effective in increasing Multi birth rate in the Baloochi ewes in breeding season.

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