

Effect of artificial insemination in different times on reproductive performance of Taleshi ewesM. Didarkhah^{1*}, F. Jamili²¹ Ph.D Student of Ruminant Nutrition, International Campus of Ferdowsi University of Mashhad, Mashhad, Iran² Ph.D Student of poultry Nutrition, International Campus of Ferdowsi University of Mashhad, Mashhad, Iran* Corresponding Author: Masooddidar@yahoo.com

Abstract: The objective of this study was to determine the best time for artificial insemination in Taleshi ewes. One hundred and fifty ewes were randomly allocated to three groups (n=50/group). Estrus was synchronized with intravaginal insertion of Controlled Internal Drug Release (CIDR) for 14 days. At the time of CIDR removal, PMSG (300IU) was injected to all of ewes. The first (AI₂₈), second (AI₄₀) and third (AI₅₂) groups were inseminated (cervically) 28, 40 and 52 hours after CIDR removal, respectively. All of ewes showed estrus signs about 24 hours after CIDR withdrawal. The results of insemination efficiency and reproduction performance indicated that in prolificacy and twin did not statistically change between the treatment groups. Insemination efficiency, lambing rate and fertility were significant difference among the groups (P<0.05). Insemination efficiency in AI₄₀ and AI₅₂ was 50% and 38% respectively, that was significantly different (P<0.05) with AI₂₈ (18%) treatment. lambing rate in AI₄₀ and AI₅₂ was 58% and 38% respectively, that was statistically difference (P<0.05) with AI₂₈ treatment. The results of this research indicated that the best time for Taleshi ewes insemination was between 40-52 hours after CIDR removal.

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1. Introduction

Nowadays in countries by modern animal husbandary, artificial insemination as a scientific way is applied for improving reproduction and refining aims in cowkeepery and raising sheep (Cardens et al., 2004; Simonetti et al., 2002). In Iran this way is carried out in original, hybrid and in a part local cows. Using this way in sheep and goat reproduction and breeding has not been clone yet practically. Since a lot of domesticated unit of our country constitute sheep and goats, considering artificial insemination and using it in the proper time for more benefit from reproduction potential capacities and local goat and sheep breeding is necessary (Cardens et al., 2004). However, artificial insemination is a proper way for increasing sheep breeding and reproduction capacity (Anel et al., 2005; Fair et al., 2007; Maxwell and Hewitt, 1986).

Many researcher reported that sheep artificial insemination in non reproduction season results in increasing fertility lamb delivery and delivery output (Evans and Maxwell, 1990; King et al., 2004). When applying artificial insemination simultaneous estrous is important which causes sheep to be estroused in a limitation time and all the sheep are inseminated in a time period (Huseini et al., 1998; Knights et al., 2001). Cognie et al. (1990) and Greling et al. (1997) observed that increasing lamb delivery rate and twing delivery rate by applying

some sponges containing 300 mg progesteron for 14 days with 300 international unit of PMSG through artificial insemination. The objective of this study was to determine the best time for artificial insemination by using three different time artificial insemination after the exit of CIDR and injecting proper rate of PMSG in Taleshi ewes.

2. Materials and Methods

Animals and Diets

The study was performed in Guilan Province, Amlash City, located in North of Iran. One hundred and fifty Taleshi ewes (45.8 ± 1.3 kg of BW) were used in completely randomized design to determine the best time for artificial insemination in Taleshi ewes. Ewes were fed in the pastures.

Experimental Procedure

Simultaneous estrous was done in the middle of July by lengthening luteal phase. CIDR was inserted in the vagina and constitutes 0/3 gr natural progesterone was administered. CIDR exit after 14 days. During the exit of CIDR all the ewes were injected 300 international unit PMSG. Artificial insemination was carried in 3 different times, 28 hours, 40 hours and 52 hours after the exit of CIDR. In this stage, sperm of rams was taken by using artificial vagina. The homogenized and sterilised milk (2/5% fat) was used for semen dilution by the

proportion 1:1. One hundred and fifty Taleshi ewes were subdivided into three same groups. After taking sperm from rams, 50 ewes in the first group (AI₂₈) which 28 hours was passed from the exit of their CIDR were inseminated intra utera. The second 50 ewes (AI₄₀) 40 hours after the exit of CIDR and 50 head ewes of the third group (AI₅₂) were inseminated 52 hours after the exit of CIDR the time of oestrous exposure was recorded through observing the herd. After ewes delivery lamb delivery rate, twin delivery rate, delivery output, multi delivery rate and insemination rate were calculated.

Statistical Analysis

Data were analyzed using the GLM procedure of SAS (Windows Version Release 8.02, SAS Inst., Inc., Cary, NC). The model used was $Y_{ij} = \mu + TRT_i + e_{ij}$, where Y_{ij} was the j observation for the dietary treatment TRT_i (artificial insemination 28, 40, or 50 hours after the exit of CIDR), e_{ij} the error associated with that observation, and the overall mean. Linear and quadratic contrasts were performed and the overall means obtained were assessed for significant differences at $P < 0.05$.

3. Results and Discussion

In neither of the ewes CIDR exit was not occurred and the CIDR based infection was not observed. All the ewes show oestrous signs 24 hours after exit of CIDR. Reproduction function results are represented in table 1. There was not observed meaningful differences in delivering twins of more off springs rates between different groups but there was a meaningful difference between delivering lambs rate and delivery output in various groups. ($p < 0.05$).

The best lamb delivery in AI₄₀ and AI₅₂ group was not observed. AI₄₀ group by 58 percent rate had the highest lamb delivery rate. The best delivery output was observed in AI₄₀ and AI₅₂ groups.

AI₄₀ by 50 percent had the highest output rate. Fertilization output results in various groups is represented in table 2. There was a meaningful difference between various groups in fertilization output. ($p < 0.05$). The best fertilization output was observed in AI₅₂ and AI₄₀ groups. AI₄₀ group by 50 percent rate had the highest fertilization rate.

AI₂₈: Ewes which were fertilized 28 hours after the exit of seeder. AI₄₀: Ewes which were fertilized 40 hours after the exit of seeder. AI₅₂: Ewes which were fertilized 52 hours after the exit of seeder.

AI₂₈: Ewes which were fertilized 28 hours after the exit of CIDR. AI₄₀: ewes which were fertilized 40 hours after the exit of CIDR. AI₅₂: ewes which were fertilized 52 hours after the exit of CIDR.

In current study the infection resulting from CIDR was not observed. Because of observing total health condition in putting CIDR operation also because Taleshi ewes have fat tail and covers the external section of the vagina which causes the CIDR is under the natural protection and the possibility of falling it is rare, careful putting seeder operation and the right putting the CIDR in vagina canal is an important factor in preventing of its falling. In current study the ewes in a 24 hours time after being injected by PMSG and the exit of CIDR showed oestrous symptoms. The progesterone 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 oestrogen increases and causes the appearance of oestrous symptoms (Cardens et al., 2004; Fair et al., 2007; Knights et al., 2001; Thatcher et al., 2002). One of the reasons that all the ewes were oestrus 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 oestral rate was sooner about after hours. A research results on Avaci breed ewes in Syria demonstrated that 82% of treated ewes showed oestrous signs within 36/48 hours after the removal of progesterone saturated sponges (Greling et al., 1997).

On the basis of insemination outcome results and reproduction function of the best insemination outcome, lamb delivery and delivery rate was not observed in AI₄₀ group for the condition of artificial insemination, knowing oestrous length of time and ovulation time is needed. Spawning in the most of ewes, by considering their breeds occurs on a fixed time in relation to oestrous initiation. (Anel et al., 2005; Donovan et al., 2004; Fair et al., 2007). In this research ewes insemination outcome reduction on the first artificial insemination time (AI₂₈) i.e 28 hours after CIDR removal can be for this reason that the ewes in this group were in their oestrous initiation and their spawning hasn't been occurred yet insemination outcome increase in AI₄₀ group can be for this reason that ewes insemination occurs is their peak time of spawning by considering the gained result we say that in Taleshi ewes the spawning was occurred in the middle of oestrous time. Donovan et al. (2004), Anel et al. (2005) and Fair et al. (2005) observed that kind of the ewe can be one of the influencing factor on the spawning time.

In a research between 3 breeds includes, Lowland cross, Hill cross and finish Landriss demonstrated that the best insemination output and pregnancy outcome related to finish Landriss breed

which their spawning time was different from the other breeds (Donovan et al., 2004). Evans et al. (1990) reported that merinos ewes spawning occurs in the kate time of esterus. Increasing insemination outcome in AI₄₀ and AI₅₂ groups can be for this reason that in these two groups Talesh ewes in time of insemination was in the middle or the late time of their spawning. Which ewes pregnancy during this period is very high and the other hand the being alive time of free ovule is between 12-24 hours and the preper life of sperm in the uterus and oviduct is about 15 hours (Donovan et al., 2004). Denovan et al. (2004) proposed that the best time for artificial insemination about 52 hours after removal of progesterone suppository for this reason that in this research we used CIDR and PMSG for esterus for simultaneity but they used from short duration progesterone treatment with prostaglandine and PMSG which artifitial insemination duration after progesterone suppository removal whl be increased (Langford, 1984). Chemineau et al. (1991) by using CIDR for 14 days reported that the best time for sheep artificial insemination is 60-65 day after CIDR

removal which disagree by this research because in this research PMSG is used (and PMSG cause the esteras time occurs sooner). Which decreases the artificial insemination time after CIDR removal. Which in the mentioned research they hadn't used from PMSG. Langford et al. (1982) reported that the best time for artificial insemination for nature crossbord was about 54 hours after sponge removal. Which approves this research. Simonetti et al. (2002) reported that artificial insemination output after esterus simultaneity was about %64 which insemination time was about 8-12 howe after observing esterus, Which conforms with this research. Rekik et al. (2004) reported that between two groups which recived 200 or 400 unit of PMSG the group which received 400 unit has the higher rate of twin delivery. Also Marassich et al. (2001) reported that the injection of 500 unit of PMSG after the end of simultaneity caused the increasing of twin delivary rate in Merinus Slovak Merino ewes which doesn't conform to this research because the added dose of PMSG causes increasing twin and multi delivery.

Table 1 - Talesh ewes reproduction function results

Group	Fertilization ewes number (head)	Delivery output (%)	lambing rate (%)	Twin delivery (%)	Multi delivery rate(%)
AI ₂₈	50	18 ^b	18 ^b	00 ^a	1 ^a
AI ₄₀	50	50 ^a	58 ^a	40 ^a	1/07 ^a
AI ₅₂	50	38 ^a	38 ^a	00 ^a	1 ^a

Table 2 - Fertilization output comparison in various groups

Group	Ewes number (head)	Fertilized ewes (head)	Insemination efficiency (%)
AI ₂₈	50	9	18 ^b
AI ₄₀	50	25	50 ^a
AI ₅₂	50	19	38 ^a

Conclusions

The results suggest that in Taleshi ewes the best time for artificial insemination is about 40 to 52 hours after CIDR removal which if Talesh ewe is inseminated in this period the most insemination and delivery outcome will be ocured.

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