



Comparing Some Reproductive Characters Of Awassi Ewes Inserted With Spanish (Ovejero Comp.) and Holland (Intervet Comp.) Made Vaginal Sponges

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Keywords

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Abstract

Awassi sheep herd (105 Ewes) was used to perform this study. Fifty (50) ewes were inserted with Spanish made (SMS) Vaginal sponges (1st group) and twenty four(24) ewes were inserted with Holland made (HMS) Vaginal sponges (2nd group), while thirty one(31) ewes (sponges free) were allowed for a natural mating (NM) System (3rd group). The statistical analysis of the data using the Least square means method indicated that the pregnancy and fertility rates were significantly ($p \leq 0.05$) higher in (HMS) (0.810 and 0.790) and (NM) (0.801 and 0.694) than that (0.483 and 0.416) of the (SMS). While variations in born lamb rates between the three treatments were not significant . The two sponged groups (SMS) and (HMS) gave significantly ($p \leq 0.01$) better twin rates (0.191 and 0.167) than that (0.048) of the (NM) ewes. Male / female lambs , lamb birth weight , lamb weaning weight , weaning rates (lambs / ewe) were all significantly ($p \leq 0.01$) higher for (HMS) and (NM) than (SMS) ewes. Young ewes appeared to be more vigor and prolific than older ewes. One and 2 years old ewes gave higher pregnancy and fertility rates than those in age 3 and 5 years and significantly ($p \leq 0.05$) higher than those in age 4 , and significantly higher at ($p \leq 0.01$) level in male / female rate . Born lamb rates differences between age groups were not significant. Twin rate produced by age 1 was (zero) significantly ($p \leq 0.01$) lower than the others , and it was significantly ($p \leq 0.01$) higher in benefit of those in age 3 than the others . Ewes in age 4 and 5 appeared to be significantly ($p \leq 0.01$) lower than those in age 1 and 2 in lamb birth weight and weaning rates , but they were significantly ($p \leq 0.01$) lower than those in age 1 only in lamb weaning weight.

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1. Introduction

The huge population increase in the world led to a competitive market demand on food products generally and meat products specially, which is considered a remarkable daily food affecting the meat prices directly. High price of the meat is positively correlated to the decrease in sheep numbers which is caused by many reasons [1] through the last twenty five years. The low prolificacy rate in local sheep breeds is due to keeping on the natural breeding system which cannot increase the lambing rate. Therefore, many studies have recommended to investigate in such researches to increase sheep productivity [2] or pregnancy rate and prolificacy (lambs per ewe) [3] and early lambing and activate the one-year old ewes using the vaginal sponges [4,5]. This protocol can give two benefits, firstly, is the possibility of gaining a high price by early marketing the high-quality lamb meat, and secondly, the early selling or weaning lambs can offer long milk season during spring and summer which increase the total yearling income. It is obvious that using the vaginal sponges' technique in many countries have increased the twin percentage to 73% [6] or the lambing percentage up to 93.8% [7] and lambs born /ewe 1.25 [8]. Synchronization of estrus in ewes focuses on the manipulation of the estrus cycle , and that included either the luteal or the follicular phase[9]. The hormonal treatment is control ovulation and reproduction , and increasing the number of pregnant ewes[10]. As we know there are a large number of sheep slaughtered every year due to reproductive problems , or the huge economic loss to the farmers due to low fecundity [11] and longer interlambing periods giving < 1 lamb/ewe/year. So, it was very useful to compare between the superiority of the two common protocols available in the local veterinary clinics, the first is produced by the Spanish Ovejero Company and the second is produced by the Holland Intervet Company as a plan of this research.

2. Materials and Methods

This experiment was carried out at a private farm (2.5 Hectare at Al- Shallalat region) ten km eastern center of Mosul city, using a total of 105 Awassi ewes (1-5 years old) . Baa'sheeqa veterinary clinic has offered fifty (50) Spanish made vaginal sponges containing 60 mg of Medroxy Progesterone hormone, produced by Ovejero Company. These sponges have inserted within two days (25 ewe/day) in to the vaginal of 1st group (SMS) ewes. Twenty Four (24) Holland made vaginal sponges containing 20 mg cronolone hormone produced by Intervet Company, bought from a private veterinary clinic and have inserted in the vaginal of the 2nd group (HMS) ewes. While the rest thirty one (31) ewes have allowed for a natural mating system (NM) representing the control group. All the sponges were removed after 12 days and the ewes in (SMS) have injected with 400 IU Medroxy Progesterone Acetate (MPA) and the ewes in (HMS) group have injected with 400 IU Pregnant Mare Serum Gonadotropin (PMSG) . All the experimental animals had a same management, veterinary care and all ewes fed a concentrate mixture (Table 1.) 300 g/ewe/day before lambing and 750 g /ewe/day after lambing in addition to wheat straw and Alfalfa green roughages according to their requirements [12]. The experimental ewes were aged (1-5years) and all the sheep were housed in a big hovel (25 x 20 m with three divisions inside) provided with all the equipments needed for feeding , drinking and the scales. The sheep can go

out during the day to a wide opened farmyard . The experiment was started at Jun 2018 – April 2019.

Table 1. Composition Of The Experimental Diet .

Ingredients	%
Crushed barley grain	55
Crushed wheat grain	10
Wheat bran	26
Soyabean meal	7
Salt and limestone	1
Supplements	2
Crud protein	14.29

Equations needed to calculate some parameters in this study as pregnancy and fertility rates and so on , are mentioned by [13] .

The data were analyzed using the statistical analysis system (SAS) [14], and the Least Square Means (LSM) method were employed to detect the comparison means . Duncan's multiple range test [15] was used to determine the significant differences between the treatment means according to Steel and Torrie [16] . The general mathematical model used in the analysis of variables was as follows :

$$y_{ij} = \mathbf{m} + t_i + r_j + e_{ij} \quad \{ i = 1,2,3 \ ; j = 1,2,3,4,5 \}$$

y_{ij} = the observation of sponge type (i) at age (j) of the ewe .

t_i = the effect of sponge type (i) .

r_j = the effect of age (j) of the ewe .

e_{ij} = the experimental error effect for observation of sponges type (i) at age (j) of the ewe .

3. Results and Discussions

3.1. Type of Sponges

Least square means of the reproductive characters studied in this research which affected by the type of sponges are given in Table.2 . Pregnancy rate of the (HMS) ewes (0.810) and (NM) ewes (0.801) were close to each other and both were significantly ($p \leq 0.05$) higher than that (0.483) of the (SMS) ewes .(HMS) ewes gave higher fertility (0.790) than the (NM) ewes (0.694) and both were significantly ($p \leq 0.05$) higher than that (0.416) of the (SMS) ewes recording an advantage of 47.3% and 40.1% for the (HMS) and (NM) Vs (SMS) ewes respectively . The (HMS) ewes gave higher born lambs (0.950) than the (SMS) ewes (0.573) , while the (NM) ewes gave 0.761 and all were un significantly variat to each other. Rate of male / female lambs born for the (HMS) ewes (1.217) was un significantly higher than that of the (NM) ewes (1.085) and both were significant

($p \leq 0.01$) to that given by the (SMS) ewes (0.636). Both sponges inserted ewe groups (SMS) and (HMS) gave significantly ($p \leq 0.01$) higher twin lambs than the (NM) group ewes which were 0.191, 0.167 and 0.048 respectively. Variations in lambs birth weight were found to be significant ($p \leq 0.01$) in favor of (HMS) lambs (3.213) and (NM) lambs (3.034) against (1.461) of the (SMS) lambs. Same significant ($p \leq 0.01$) superiority in lamb weaning weights were found (17.357) for the (HMS) lambs and (17.372) for the (NM) lambs compared to that (7.195) of the (SMS) lambs. Means of weaning rates (Table 2) indicate that ewes in (HMS) group seems to be more prolific scoring 0.720 lambs per ewe followed by 0.674 lambs per ewe for (NM) ewes and both were significantly ($p \leq 0.01$) more prolific than 0.339 lambs per ewe for the (SMS) ewes. These results are in agreement with those reported by [8] when ewes were treated with vaginal sponges vs. CIDR in fertility, lambing and twin percentage. [17] have mentioned same results when left the control group ewes to a natural mating and the 2nd group inserted sponges with 2mg Progesterone and injected 300 IU PMSG, both groups did not differ significantly in fertility, lambing, but differ in twin rates, while their results of reproductive characters increased significantly ($p \leq 0.05$), and they reported higher prolificacy which reached 1.8 lamb/ewe in the 3rd group when 1mg of Progesterone (Lutone) added to that given in 2nd group. The low twin percentage in this study might be due to the natural ability of the Awassi breed (single ova), or the dose of 400 IU of PMSG is less effective to induce twin births, so increasing the dose of PMSG up to 600 IU gave a high twin percentage in Awassi ewes up to 73% as found by [6], and the fertility up to 96% [18]. Using different treatments with a vaginal sponge might affect the ewe reproductivity as reported by [7] that FSH administration VS eCG resulted in higher lambing rate (93.8% Vs 57.10%) and higher number of lambs born per ewe exposed to rams (1.4 Vs 0.8). While [19] reported insignificant variations in fertility and lambing rates with injecting 400 or 600 IU eGC for ewe groups.

Table 2. Effect of Vaginal Sponge Types on Some Reproductive characters of Ewes.

Trait	Vaginal Sponges		
	SMS	HMS	Control (NM)
Ewe number	50	24	31
Pregnancy rate	0.483 ^B	0.810 ^A	0.801 ^A
Fertility rate	0.416 ^B	0.790 ^A	0.694 ^A
Born lambs	0.573	0.950	0.761
Male / female lambs	0.636 ^B	1.217 ^A	1.085 ^A
Twins	0.191 ^A	0.167 ^A	0.048 ^B
Lambs birth weight	1.461 ^B	3.213 ^A	3.034 ^A
Lambs weaning weight	7.195 ^B	17.357 ^A	17.372 ^A
Weaning rate , lambs / ewe (prolificacy)	0.339 ^B	0.720 ^A	0.674 ^A

3.2. Age of Ewes

The studied characters for different ewe ages are given in Table 3. The means of pregnancy rate indicate that ewes of 1,2,3, and 5 years old did not differ significantly from each other and they gave 0.821, 0.840, 0.679 and 0.750 respectively, while ewes in age 4 gave pregnancy rate (0.400) significantly ($p \leq 0.05$) lower than those of age 1,2 and 5. One and 2 years old ewes gave the best (p

≤ 0.05) fertility rate (0.795 and 0.806) than the 4 years old ewes (0.400), while those of 3 and 5 years old ewes were intermediate giving 0.635 and 0.530 respectively. Results indicate that lambs born for ewes aged 1, 2, 3, 4 and 5 were 0.795, 0.987, 0.857, 0.467 and 0.700 with no significant differences respectively. Ewes in age 2 gave male / female lambs (1.227) significantly (p≤0.01) higher than that (0.633) of 4 years old ewes, while age 1, 3 and 5 ewes gave rates 1.124, 0.952 and 0.958 did not differ significantly with the others respectively. Three years old ewes gave twins (0.231) significantly (p≤0.01) higher than the others, and 1 year old ewes gave no twins (0.000) which is differ significantly with the others, while variations between the rates of age 2 (0.143), 4(0.125) and 5(0.143) were not significant. Lambs birth weight appeared to be significantly (p≤0.01) higher for ewes age 1 (3.318) and age 2 (3.331) than those in age 4 (1.700) and age 5 (1.942), while that of age 3 (2.557) did not differ with the others significantly. Least square means for lambs weaning weight given in Table 3. Show that 1 year old ewes was (18.771) un significantly higher than those of 2 years old (17.546) and 3 years old (13.114), but it was significantly (p≤0.01) higher than those of 4 years old (10.133) and 5 years old (10.308) but, that of the 3 years old did not variate significantly with the others. Finally, 1 and 2 years old ewe gave good prolificacy (0.795 and 0.773 lambs / ewe) significantly (p≤0.01) higher than those of 4 years old (0.400) and 5 years old (0.330 lambs / ewe), while the 3 years old gave (0.591) un significant variation with the others. Ewes in group 1 and 2 years old appeared to be more vigor leading the others in many valuable characters starting with pregnancy and fertility, and ending with the prolificacy rate, which is in agreement with that reported by [20] when found milk production of 2 years old ewes was superior (p ≤ 0.01) to the other groups and these findings support the same findings that mentioned by [21] who recorded milk production 652 g for 2 years old ewes Vs 592 g for the 3 years old ewes which is affect the lambs growth directly and form the lamb weaning weight. Results of this experiment indicate that rates of most reproductive ewe traits declined from age

Table 3. Effect of Ewe Age on Some Reproductive characters.

Trait	Ewe age				
	1 year	2 years	3 years	4 years	5 years
Ewe number	20	27	24	19	15
Pregnancy rate	0.821 ^A	0.840 ^A	0.679 ^{AB}	0.400 ^B	0.750 ^A
Fertility rate	0.795 ^A	0.806 ^A	0.635 ^{AB}	0.400 ^B	0.530 ^{AB}
Born lambs	0.795	0.987	0.857	0.467	0.700
Male / female lambs	1.124 ^{AB}	1.227 ^A	0.952 ^{AB}	0.633 ^B	0.958 ^{AB}
Twins	0.000 ^C	0.143 ^B	0.231 ^A	0.125 ^B	0.143 ^B
Lamb's birth weight	3.318 ^A	3.331 ^A	2.557 ^{AB}	1.700 ^B	1.942 ^B
Lamb's weaning weight	18.771 ^A	17.546 ^{AB}	13.114 ^{AB}	10.133 ^B	10.308 ^B
Weaning rate, lambs/ewe (prolificacy)	0.795 ^A	0.773 ^A	0.591 ^{AB}	0.400 ^B	0.330 ^B

3-5 and mostly in age 4 which were in disagreement with those reported by [4] when mentioned that the reproductive traits advance positively with ewe age up to 4-5 years old, then correlate negatively . On same direction [22] reported that lambing percentage were 31.2, 66.7, 73.7, 72.2 and 59.7% for 2, 3, 4, 5 and 6 years old ewes but , the fertility increased from 43% for 2 years old ewes up to 100% for 4years old ewes . Similar findings were reported by [23] that lambing percentage increased positively 31.0, 59.7 and 58. 5% when ewes became older 2,3 and 4 years old respectively, but the lamb birth weights and weaning weights did not differ significantly. Lambs birth weight of this study was very close to those (3.3-4.7 kg) found by [4]. A significant effect for the ewe age on lambs weaning weights was reported by [24, 25,26] as well . The prolificacy rates of ewes in this study found to by lower than that mentioned by [3] .

4. Conclusion

Results of this study indicated that Holland made sponges (HMS) gave good reproductive characters and concluded high production rates and high prolific than the Spanish made sponges (SMS) or the natural mating (NM) . So it can be recommended for a farm seasonally practical activities as a good protocol , as well as the young ewes which can be recommended for high productive ability and more prolific than the old age ewes .

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