



Response of different genetic groups of sheep to nutritional flushing in their reproductive performance

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Abstract

This research aims to find out the response of different groups of sheep to Nutritional Flushing and analyse the impact of this response on their reproductive performance, where 60 sheep of different ages were used in the experiment, 3 different groups of sheep breeds were selected (Naimi, Awasi karakul bat, Awasi Hamdani bat) and 3 control groups of the same breeds with 10 sheep per group agencies : the first treatment: - control group Pure Naimi sheep / 10 head, the second treatment: - control group Awasi bat + karakul / 10 heads, the third treatment: - control group sheep bat Awassi + Hamdani / 10 heads, the fourth treatment: - Nutritional Flushing group Pure Naimi sheep / 10 Ras, the fifth transaction: - Nutritional Flushing group al-mudrab Awasi + Karakul Sheep / 10 Ras, the sixth transaction: Nutritional Flushing group al-mudrab Awasi + Hamdani sheep / 10 Ras. The experimental groups were given a Nutritional Flushing of 3% of the animal's weight, concentrated feed six weeks before the fertilization process and six weeks before the birth process, with the provision of hay and free jet threshing as needed, in addition to water and mineral salts, the results of the experiment showed a moral superiority ($P < 0.05$) in the fertility and fertilization rates, the percentage of births and the percentage of pregnancy and the ratio of twins and fertility, and we conclude that the treatment with Nutritional Flushing for the three groups of sheep (Naimi, Awasi mudrab The use of a Nutritional Flushing for the three sheep groups at a concentration of 3 % of the animal's weight six weeks before the fertilization process and six weeks before the birth process, with the provision of hay and free jet threshing as needed, in addition to water and mineral salts, has given the best results compared to natural feeding(control group).

Keywords: Nutritional Flushing, reproductive qualities, sheep aggregates (Naimi, Awassi Al-karakul bat, Al-Awassi Hamdani bat)



Introduction

The sheep breeding industry is one of the most important agricultural sectors in the world, as it contributes significantly to meeting human needs for meat, wool and other animal products, as sheep form an important part of livestock, as the sheep census in Iraq for the year 2020 reached (6723,866) [1].

There are several breeds of local sheep in Iraq that follow the group of sheep with a thick coat and coarse wool, and one of the most important characteristics of local sheep is their ability to withstand environmental conditions such as high heat, lack of nutrients and resistance to disease, and local sheep in the country are characterized by their low productivity of animal products [2]. The Iraqi sheep belong to the Asian sheep with a wide mechanism and include three veins, namely the Karadi, Awassi and Arabi, and sheep are one of the most important sources of livestock in Iraq and represent a large part of the national agricultural income, and are raised and live on the margins of Agriculture and natural pastures, so their productivity and fertility are low, which necessitates taking care of them by modern scientific and technical methods [3]. To ensure the sustainability of this vital industry, it is necessary to understand how nutrition affects the health and performance of sheep. Recent research shows that sheep respond differently to food drives based on several factors, such as breed, age, health and environment, so this deep understanding of nutrition and sheep's response to it becomes vital for maximum productivity and sustainability in this sector [4]. And in a study that sheep respond variably to feeding based on factors such as breed, age and environment [5]. Another study, [6], also shows that providing proper nutrition can improve reproductive performance in sheep and increase productivity. However, there remains an urgent need for additional studies to understand the complex interactions between the various factors that affect the sheep's response to nutrition. achieving excellent reproductive and productive performance of sheep can have a significant impact on their role in meeting the needs of humans for meat and other products. Therefore, this research aims to explore the response of different groups of sheep to feeding elaborately and analyze the impact of this response on their reproductive and productive performance, the various factors that play a role in this process will be addressed, which can contribute to guiding recommendations and guidelines for farmers and breeders in order to make the most of different sheep groups. this study aims to compare the response of different genetic groups (pure Naimi, Awassi Hamdani and, Awassi Karakol bat) to Nutritional Flushing six weeks before fertilization and six weeks before calving and measure productive qualities and reproductive.

Materials and Methods

This study was conducted in one of the sheep fields belonging to the Husseini holy shrine in Karbala governorate located 15 km south of Karbala city for the period from the eighth of November 2023 to the first of May 2024. This research aims to find out the response of different groups of sheep to Nutritional Flushing and analyze the impact of this response on their reproductive performance, 60 sheep of different ages were



used in the experiment, 3 different groups of sheep breeds were selected (Naimi, Awasi karakul and, Awasi Hamdani bat) and 3 control groups of the same breeds with 10 sheep per group agencies : the first treatment: - control group Pure Naimi sheep / 10 head, the second treatment: - control group Awasi bat + karakul / 10 heads, the third treatment: - control group sheep bat Awassi + Hamdani / 10 heads, the fourth treatment: -Nutritional Flushing group Pure Naimi sheep / 10 Ras, the fifth transaction: -Nutritional Flushing group al-mudrab Awasi + Karakul Sheep / 10 Ras, the sixth transaction: Nutritional Flushing group al-mudrab Awasi + Hamdani sheep / 10 Ras. After that, the ewes were numbered and isolated from each other by means of metal cutters, as colored ribbons wrapped around the animal's neck were used to make it easier to distinguish it from the rest of the animals, and the ewes ' ages were recorded from the station's field register. The experimental groups were given a nutritional payment of 3% of the animal's weight, concentrated feed as shown in Table 1, six weeks before the feeding process and six weeks before the birth process, with the provision of hay and free jet threshing as needed, in addition to water and mineral salts.

The experiment included the study of some reproductive parameters: the percentage of appearance of estrus, the fertility rate, the fertilization rate , the pregnancy rate, the birth rate, the percentage of twins, fertility, the percentage of missing to study the effect of Nutritional Flushing in the studied traits, the differences between the averages were compared using the Duncan polynomial test [7] and the ready-made statistical program SAS [8] was used to analyze the data.

Table (1): Components of concentrated gooseberry for Lambs

Sequence	feed material	The percentage in the Bush (%)
1	Corn	% 10
2	Barley	% 50
3	Wheat bran	% 30
4	Soybean cassava	% 8
5	Minerals and salts	% 1
6	Vitamins	% 1
Total		100%

Results and Discussion

Table (2) shows the results of a statistical analysis to study the effect of a Nutritional Flushing of 3% concentrated feed by body weight on three groups of sheep (Naimi, Awassi Hamdani, and Awassi Karakol) in comparison with the control group to the absence of significant differences in the percentage of appearance of estrus, the



percentage of pregnancy, the percentage of twins and fertility. While we note that there was a significant superiority ($P \leq 0.05$) in the fertility rate, fertilization rate, birth rate and missed rate of Nutritional Flushing transaction, where the percentage was equal in the fertility and fertilization rate and reached (90% Naimi, 100% Awasi Hamdani racket, 80% Awasi Karakol racket) and reached in the percentage of births (100% Naimi, 100% Awasi Hamdani racket, 90% Awasi Karakol racket) and the percentage of missed (10% Naimi, 0% Awasi Hamdani racket, 20% Awasi Karakol racket) compared to the control group, which reached the fertility rate (80% Naimi, 70% Awasi Hamdani racket, 70% Awasi Karakol racket), the percentage of fertilization (90% Naimi, 70% Awasi Hamdani racket, 80% Awasi Karakol racket) and the percentage of births (80% Naimi, 80% Awasi Karakol racket). We also note in the Nutritional Flushing group that the number of females that showed estrus has reached (10 Naimi, 10 Awasi Hamdani racket, and 10 Awasi Karakol racket), and the number of pregnant females is (10 Naimi, 10 Awasi Hamdani racket, and 9 Awasi racket), and the number of pregnant females is (10 Naimi, 10 Awasi Hamdani racket, and 9 Awasi the total number of births is (9 Naimi, 10 Awasi Hamdani racket, and 8 Awasi Karakol racket) and the total number of births is (10 Naimi, 10 Awasi Hamdani racket, 9 Awasi Karakol racket), compared with the control group, where the number of females that showed (10 Naimi, 9 Awasi Hamdani racket, and 9 Awasi Karakol racket), and the number of females. The number of pregnant women is (9 Naimi, 8 Awasi Hamdani racket, and 8 Awasi Karakol racket), the number of female mothers is (8 Naimi, 7 Awasi Hamdani racket, and 7 Awasi Karakol racket) and the total number of births is (8 Naimi, 8 Awasi Hamdani racket, 7 Awasi Karakol racket), while it was noted that there were no twins in either group.

It is clear from the results that the effect of Nutritional Flushing differs between the three breeds, with a noticeable superiority of Awassi bat Hamdani sheep in the Nutritional Flushing Group, for example, the fertility rate in the Awassi bat Hamdani breed was 100% in the Nutritional Flushing group, while it was only 80% in the control group. While the Naimi and Al-Awassi karakul bat strain showed a varying response between the food push and control groups, this suggests that genetic differences between strains may play an important role in determining their response to enhanced feeding. These differences reflect the influence of genetic factors on the ability of different breeds to benefit from nutritional payment, studies show that breeds with a higher genetic ability of the ovaries to respond to additional nutrition show better results in fertility and fertilization rates [9]. And different breeds may be better adapted to certain environmental conditions, which affects their response to improved nutrition. For example, breeds hailing from areas with scarce food resources may show a greater response to improved nutrition compared to breeds living in environments rich in food sources (10). In addition, Nutritional Flushing has a significant impact on some aspects of reproductive performance through its impact on both body weight and body condition, Nutritional Flushing increases the rate of ovulation, fertilization and birth rate and reduces the loss of embryos studies indicate that the more ewes are given a high



nutritional level, the higher the rate of ovulation, fertilization and birth rate and reduce the loss of embryos [11,12]. [13] showed the effect of different levels of nutrition and nutritional payment in the fertilization process, where he found that nutritional payment affects fertility and pregnancy, especially nutrition in the last weeks of pregnancy, and the impact of this was reflected in the daily, weekly and total milk production. A study by [14]. showed that increased nutrition before mating can enhance the response of the ovaries, which leads to an increase in the percentage of pregnant females and the number of births. These results are consistent with the current ones, since all strains in the feeding group showed higher fertility and fertilization ratios compared to the control group [15]. demonstrated the existence of an influence of different feeding levels in some manifestations of the reproductive performance of emotional ewes. Another study by [16] confirmed that intensive feeding of females before and during the mating season increases birth rates. The study showed that females who receive additional nutrition have a higher ability to maintain pregnancy and provide optimal conditions for fetal development. This is consistent with the current results where the percentage of births in the feeding group increased compared to the control group [17]. found in a study in which they divided a number of ewes into two groups, the first was given a normal nutritional level, the second was given a low nutritional level, and the ewes were placed under a nutritional payment program for three weeks to improve ovulation rates. before feeding, there were differences between the two groups in body weight 10 kg and body condition score 1.1, where it increased in the first group from the second and after feeding the difference was for body weight 18 kg and body condition score 2.2 between the first and second [18]. explained the effect of nutrition on the productive efficiency of females by affecting their estrus cycle, ovarian activity and fetal survival inside the uterus, as the nutritional boost affects this efficiency because it equips the body with its need for energy and protein to sustain, grow and maintain ovulation rates through the metabolism of glucose amino acids. A study by [19]. found that improving nutrition for females reduces the percentage of Miss (females who did not get pregnant or did not give birth). The study indicated that good nutrition contributes to improving the overall health of females, which reduces the loss of embryos and increases the rates of successful births. In this research, the percentage of misses was lower in the Nutritional Flushing group compared to the control group. Moreover, nutritional payment can increase the birth rate by (10 to 20) % by improving the nutritional status before fertilization and before calving, this practice involves feeding with higher quality pasture or supplementing with cereals, providing the necessary energy boost to the animals, and although nutritional payment does not always guarantee an increase in birth rates beyond genetic potential, it significantly supports the overall health and reproductive efficiency of the herd [20]. Research shows that nutritional propulsion can significantly improve weight and body condition in sheep and goats. For example, a study on diogenaeen sheep in Ethiopia showed that proper nutritional payment using isonitrogen diets providing either low or high transferable energy leads to significant weight gain and improvement of body condition during the mating period and the middle of



pregnancy. The study found that meals that provided higher energy levels achieved a greater increase in weight and body condition compared to low-energy meals [20]. This supplement not only supported energy needs during critical periods but also improved reproductive performance, reducing the time required for the return of the estrus cycle and increasing fertilization rates [21]. Nutritional push helps to improve the body condition of weakened ewes, ewes with a reduced physical condition respond better to such additional feeding, which increases the likelihood of ovulation and successful fertilization of embryos. This leads to an increase in the rate of pregnancy and childbirth, thereby improving the overall profitability of the farm [20,22].

Table (2): Comparison of different genetic aggregates in the studied reproductive traits

Adjective	Control Aggregates			Nutritional Flushing group			Chi-Square (χ^2)
	Awassi racker Karakol	Awassi Hamdani Racker	Naimi	Awassi racker Karakol	Awassi Hamdani Racker	Naimi	
Total number of females	10	10	10	10	10	10	--
Number of females that showed estrus	9	9	10	10	10	10	--
Estrus (%)	90%	90%	100%	100%	100%	100%	0.771 NS
Number of pregnant females	8	8	9	9	10	10	--
Number of female mothers	7	7	8	8	10	9	--
Fertility (%)	70%	70%	80%	80%	100%	90%	5.028 *
Fertilization rate (%)	80%	70%	90%	80%	100%	90%	4.956 *
Pregnancy rate (%)	80%	80%	90%	90%	100%	100%	2.194 NS
Total number of births	7	8	8	9	10	10	--
Number of twin births	0	0	0	0	0	0	--
Birth rate (%)	70%	80%	80%	90%	100%	100%	4.961 *
Percentage of twins (%)	0%	0%	0%	0%	0%	0%	0.00 NS
Lush #	1.0 ±0.00	1.1 ±0.04	1.0 ±0.00	1.1 ±0.04	1.0 ±0.00	1.1 ±0.04	
Missed Percentage (%)	30%	30%	20%	20%	0%	10%	5.028 *

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