

## REPRODUCTIVE TRAITS OF GERMAN FAWN GOATS IN VOJVODINA\*\*

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**Abstract:** Reproductive efficiency of goats of German fawn breed was established based on reproduction parameters: age of goats at first mating and first kidding, duration of gestation, kidding interval, number of kids in the litter and mass of kids at birth and weaning.

Average age of goats at first mating was 242 days, and first kidding 398,1 days. Duration of gestation was in average 151,6 days, and kidding interval 337 days, which is characteristic for dairy goat breeds. Number of kids in litter varied from 1 to 4, and in average it was 1,96 kids. Average mass of kids at birth was 3,38 and differed significantly depending on the sex, type of birth and order of kidding (parity), whereas the mass of kids at weaning was 18,39 kg and was under the influence of sex and type of birth.

Based on presented reproductive indices of German fawn goats in Vojvodina, it can be concluded that this breed has adjusted well to local conditions and that they realize results similar to those obtained in Germany, the country of origin.

**Key words:** goats, reproductive traits, mass of kids

### Introduction

Goat production in Serbia, as stated by Žujović *et al.* (2004), is characterized by presence of low productive genotypes, extensive breeding and low number of goats per breeder. The same authors pointed out that modern goat production in Serbia demanded changes in breeding methods, with focus on increased fertility and milk yield of goats.

Reproductive efficiency of goats is very important, from the aspect of milk production, and especially meat production. Reproductive goat traits, as stated by Sodiq *et al.* (2003), are the main traits which determine the productivity of goats, which especially relates to meat production. These traits

are under the influence of genetic and factors of the environment (Grayling 2000; Song et al., 2006). Moaen-ud-Din et al. 2008 state that reproductive efficiency of goats can be established based on parameters: number of live born kids, mass of kids at birth and weaning, kidding interval and duration of reproduction cycle, whereas Song et al. (2006) state that reproductive efficiency of goats is determined by age of goats at first kidding, kidding interval, type of birth, litter size and mass of kids at birth and weaning.

Objective of this paper is to present results of reproduction of German fawn goat reared from recent period in our country.

## Material and methods

Investigations were carried out in the period from 2003 to 2007, on goat farm „Selekt-milk“ in Indija. Goats on this farm are reared intensively, in the closed facility, nutrition is balanced and rations consist of concentrated mixtures and high quality alfalfa and meadow hay as forage part. Mating of goats is individual and natural. Majority of goats mate during the period August-September, and kid in the period January-February. Kids are measured/weighed individually at birth and at weaning.

Investigations included 330 kiddings of German fawn goats.

The following parameters were investigated: age of goats at first mating and first kidding, duration of gestation, kidding interval (period between consecutive kiddings), number of kids in the litter and mass of kids at birth and weaning.

Statistical processing of data was done using computer program STATISTIKA v.8.

## Results and discussion

It is known that goats are of seasonal mating character, season starts with shortening of the daily amount of light. Sodiq et al. (2003) state that breeds from tropical regions demonstrate oestrus throughout the year, and Riera (1982), classifies all goat breeds according to the seasonal characteristic of their sexual activity into two groups: continuous and seasonal type.

Most of goat breeds, as stated by Moaen-ud-Din et al. (2008), reach sexual maturity at the age of 6 to 8 months. In regard to extensive rearing system, as pointed out by Sodiq et al. (2003), beginning of their exploitation in reproduction depends more on the intensity of growth than their age, and it is practiced at the age when goats reach 60-70% of body mass of mature goats. Same authors state that age of goats at the beginning of their utilization in mating is important from two aspects: early use in reproduction shortens

generation interval and accelerates genetic progress, and on the other hand reproductive efficiency of goats in their lifetime is increased by their early use in mating. Average age of investigated goats at first mating was 242 days (table 1), which is approximately 8 months, whereas the average age of investigated goats at first kidding was 398,1 days, i.e.13 months. *Song et al. (2006)* presented the age of goats at first kidding in extensive rearing system of 412,1 days and in intensive rearing system of 382 days, whereas *Alexandre et al. (1999)* in their investigation of Creole goat breed established age at first kidding of 17,2 months.

**Table 1. Age at first mating and at first kidding, gestation length and kidding interval**

	x	Sx	S	Min-max
Age at first mating, days	242	3,77	19,22	190-259
Age at first kidding, days	398,1	4,54	38,49	340-497
Gestation length, days	151,6	0,11	2,14	141-157
Kidding interval, days	337	2,58	37,38	222-498

Duration of gestation in sheep and goats is influenced by numerous physiological and environment factors (*Amoah et al., 1996; Moaen-ud-Din et al., 2008*). In our investigations (table 1), average duration of gestation in 330 goats was 152 days, with variations from 141 to 187 days. Previous researches of the duration of gestation of goats of various breeds show average values for stated trait of  $150 \pm 7,4$  days in Chinese Matou breed (*Moaen-ud-Din et al., 2008*),  $148 \pm 3,6$  days in Boer goats (*Grayling 2000*) and  $148,6 \pm 0,9$  days, with interval from 141 to 157 days also in goats of Boer breed (*Lehloenya et al., 2005*).

Kidding interval – period between two consecutive kiddings is parameter very important in fattening goat breeds. In these goat breeds lactation lasts only as long as kids are sucking milk, which enables three kiddings in two years. So, *Alexandre et al. (1999)* show kidding interval of 8,5 months in Creole goats, whereas this interval in Chinese goat breeds established by *Moaen-ud-Din et al. (2008)* varied from 217 to 334 days, depending on the breed and parity. In dairy breeds, however, because of duration of lactation period from 240 to 330 days, optimal kidding interval is 365 days. Kidding interval of investigated goats in our researches (table 1) varied within limits 222-498 days, in average 337 days.

Litter size or number of kids in the litter was defined by *Alexandre et al. (1999)* as total number of born kids per kidding and per goat. Based on

number of kids per kidding and goat, this animal species is considered as multiparous animal (*Amoah and Gelaye, 1990*). This goat trait is caused by numerous factors. *Amoah and Gelaye, (1990)* established that litter size was under significant influence of goat age and parity, whereas *Awemu et al. (1999)* stated parity, year and season as factors of importance for goat litter size. Average number of kids per goat litter in our researches (table 2) was 1,96 kids. Obtained value is in accordance with literature data for goats of different breeds (1,85 kids - *Amoah et al., (1996)*; 2,06 kids - *Sodiq et al. (2003)*; 2,09 kids - *Moaen-ud-Din et al. (2008)*, and increase of this average can be expected, considering that of total number of kiddings included in the research 69% were first and second kidding, when litter size is smaller compared to later kiddings.

**Table 2. Number of kids per litter, Birth and weaning weight of kids in kg**

	x	Sx	S	Min-max
Number of kids per litter	1,96	0,04	0,70	1-4
Birth weight of kids, kg	3,38	0,03	0,73	1,5-5,6
Weaning weight of kids, kg	18,39	0,07	1,39	15,5-22

One of the economically important traits, as stated by *Afzal et al. (2004)* is mass of kids at birth, which is influenced by breed, but also under significant influence of year, season, kid sex, type of birth as well as age of mothers. Average kid mass (table 2) was 3,38 kg and, but the masses at birth of kids depending on the sex, type of birth and mother's age were statistically significantly different (unpublished data). *Amoah et al. (1996)* presented average mass of kids of dairy goat breeds of  $3,24 \pm 0.643$  kg, and established that male kids were statistically significantly heavier than female kids, and that kid mass decreased significantly with the increase of number of kids in litter.

Mass of kids prior to weaning can be included into reproductive parameters since it greatly depends on milk yield of goat, composition of its milk as well as other maternal characteristics. This parameter, however, is important from the aspect of the estimation of the growth ability. *Otuma and Osakwe, (2008)* have established that this trait is under significant influence of season, type of birth and sex, whereas parity has no significant effect, contrary to its effect on mass at birth. Also, stated authors have established that increase of mass of kids at weaning can induce considerable improvement of body mass of kids at later age, since these parameters are in positive genetic correlation. Average mass of kids at weaning in our researches was 18,39 kg (table 2), with variations from 15,5 to 22 kg.

## Conclusion

In order to be able to investigate the reproductive efficiency of goats and their selection based on reproduction results, it is necessary to keep main records and record all major moments, such as date of mating, kidding, and number of kids in the litter and sex of kids. Also, it is necessary to measure precisely and individually animals at birth and weaning. Unfortunately, this is not regular practice in our goat production. Very few goats in Vojvodina are included in control of productivity. According to the Report of the Republic service for this region, during 2008, productivity of 966 goats was controlled.

Based on presented reproductive indices of German fawn goats in Vojvodina, it can be concluded that this breed has adjusted well to local conditions and that they realize results similar to those obtained in Germany, (*Spath and Thume, 2000*), the country of origin.

## REPRODUKTIVNE OSOBINE NEMAČKE ŠARENE KOZE U VOJVODINI

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### Rezime

Reproduktivna efikasnost koza nemačke šarene rase je utvrđena na osnovu parametara reprodukcije: starosti koza pri prvom pripustu i prvom jarenju, dužine bremenitosti, intervala jarenja, broja jaradi u leglu, mase jaradi na rođenju i na zalučanju.

Prosečna starost koza pri prvom pripustu iznosila je 242 dana, a pri prvom jarenju 398,1 dan. Dužina bremenitosti je u proseku iznosila 151,6 dana, a interval jarenja 337 dana, što je karakteristično za mlečne rase koza. Broj jaradi u leglu se kretao u intervalu 1-4, a prosečno je iznosio 1,96 jaradi. Prosečna masa jaradi pri rođenju iznosila je 3,38 i značajno se razlikovala u zavisnosti od pola, tipa rođenja i jarenja po redu (pariteta), dok je masa jaradi pri zalučanju iznosila 18, 39 kg i bila je uslovljena polom i tipom rođenja.

Na osnovu prikazanih reproduktivnih pokazatelja koza nemačke šarene rase u Vojvodini, može se zaključiti da se ova rasa veoma dobro aklimatizovala, i da postiže rezultate slične onima u Nemačkoj, zemlji iz koje potiče.

**Ključne reči:** koze, reproduktivne osobine, masa jaradi

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