SHEEP FARMING IN BULGARIA

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Bulgaria’s Sheep Sector in Retrospect: Dynamics, Decline, and Prospects

- Sheep farming is a traditional livelihood in Bulgaria, dating back thousands of years.
- At its peak in the 1980s, the country had over 10 million sheep.
- Today (2023–2024), the number has fallen to around 1.07 million.
- This represents a dramatic decline of over 85% in less than four decades.

Trends Over the Last 5 Years

Indicator	2019	2023	2024
Total sheep population	1,281,000	1,072,768	1,020,900
Sheep milk production (million liters)	67.0	50.3	20.5
Sheep meat production (tons)	>10,000	9,362	*Not available*

Why Did We Get Here? Key Reasons for Decline

- Low subsidies compared to other EU countries
- Lack of labor, especially in mountainous areas
- Low purchase prices for milk, meat, and wool
- Disease outbreaks and veterinary trade restrictions
- Unregulated price hikes by intermediaries in the supply chain
- Low economic viability for smallholder sheep farms

Indigenous Breeds – A National Treasure of Bulgaria

Breed diversity in Bulgaria:

- Total of **18 indigenous breeds**
- Among them:
  6 endangered breeds (FAO classification)
  5 considered vulnerable
  7 not currently at risk

Pleven Blackhead

Splotch-faced Maritsa (Vakla Marishka) Sheep

White Maritsa (Byala Marishka) Sheep

Kotlen Sheep

Study on synchronization of estrus in Lacaune sheep during the ancestral season

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Weaned lambs area

Rams area

The housing system is barn-based. The farm is specialized in dairy production. The sheep are divided into groups, and reproductive management is designed for year-round milking. The farm has 9 buildings, each divided into sectors depending on the animals' needs.

Farm Verde – Reproductive and Dairy Management

Farm Verde raises the Lacaune breed, with approximately 1,400 ewes. The animals are divided into the following technological groups:

1. Maternity unit
2. Weaned lambs
3. Suckling lambs
4. Rams
5. Yearling ewes
6. Milking ewes
7. Dry ewes
8. Pregnant ewes

Achieving the milk potential of the breed requires long-term selection and high-quality feeding. The animals are fed with high-quality complete mixed rations using a feed mixer. In some sectors, feed is distributed via feed belts, while in others via feeding paths. Each ration is adjusted to the specific needs of each group.

Milking is performed twice daily in a 2x36 milking parlor (72 stalls) with a central milk line.

Artificial insemination equipment and collected semen

Hormonal estrus synchronization using vaginal sponges

- Ultrasound examination was performed between the 40th and 50th day after the insemination of the ewes.

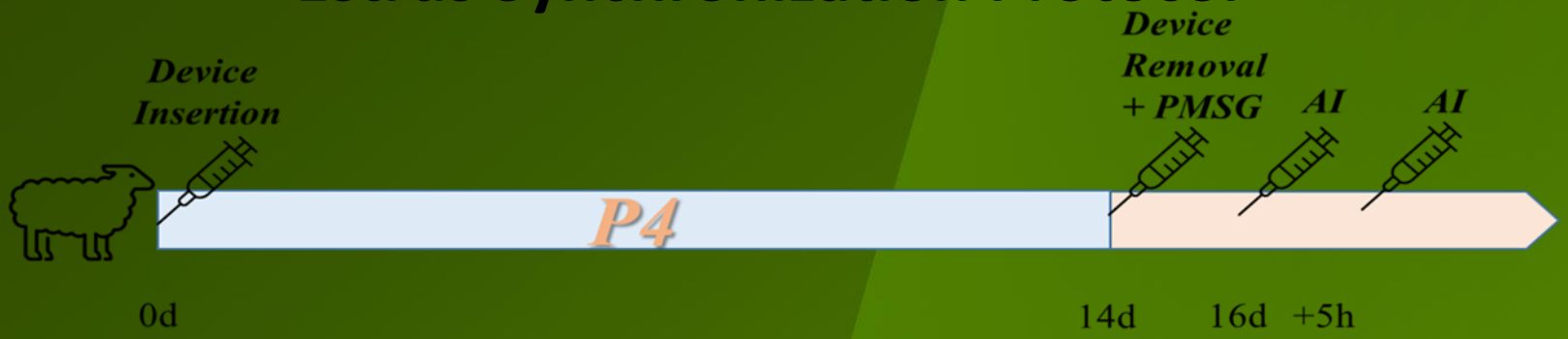
The main ultrasound criteria for pregnancy diagnosis were monitored, including the presence of an embryo or fetus, the presence of placentomes, and the determination of fetal number

Estrus synchronization is a key tool for intensifying and regulating the reproductive process in sheep farming. It enables the control of lambing periods according to market demands for milk and lambs.

MATERIALS AND METHODS

Data on estrus synchronization were collected from 318 ewes, all of which were synchronized on the same day (318, of which 81 were re-inseminated). The synchronization was performed during the anestrous season in April 2022.

Estrus Synchronization Protocol

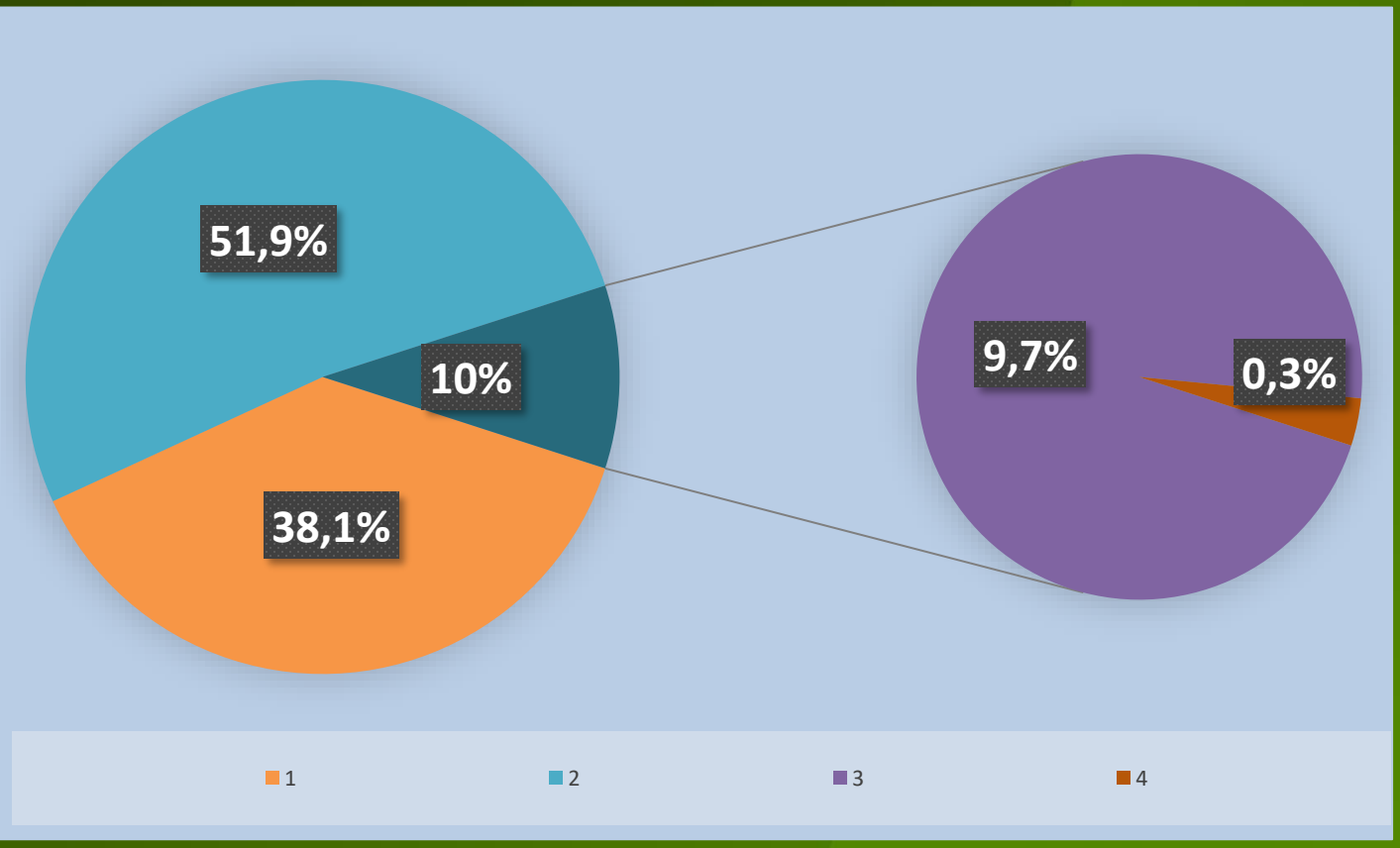


RESULTS AND DISCUSSION

Mean values of key reproductive parameters in Lacaune ewes subjected to estrus synchronization and artificial insemination.

Parameter	Mean	±SE
Total Conception rate, %	81.062	3.706
Total Biological prolificacy, % (n/N)	1.724	0.063
Abortion rate, %	3.697	1.986
Prolificacy, number of lambs per group	1.340	0.084
Multiple pregnancies, % (exclude abortions)	62.536	4.818

Percentage Distribution by Litter Size in Lacaune Ewes



- 1 Single Lambs 38%
- 2 Twin Lambs 52%
- 3 Triplets 9.7%
- 4 Quadruplets 0.3%

Parameter	Mating method	Category	N	Mean (%)	±SE
Conception rate, %	AI	Nulliparous ewes	54	74.07	5.649
		Multiparous ewes	264	71.21	2.555
	natural meeting	Nulliparous ewes	11	81.82	12.52
		Multiparous ewes	70	97.14	4.962
Multiple birth rate, N	AI	Nulliparous ewes	36	1.694	0.106
		Multiparous ewes	178	1.798	0.048
	natural meeting	Nulliparous ewes	9	1.889	0.212
		Multiparous ewes	68	1.515	0.077

Percentage of pregnant ewes and farm-level prolificacy according to animal category (yearlings and adult ewes) and insemination order in Lacaune ewes.

Parameter	Mating method	Category	N	Mean (%)	±SE
Abortion rate, %	AI	Nulliparous ewes	40	10.00	3.179
		Multiparous ewes	188	4.787	1.466
	natural meeting	Nulliparous ewes	9	0.000	6.702
		Multiparous ewes	68	0.000	2.438
Prolificacy, number of lambs per group N	AI	Nulliparous ewes	54	1.130	0.128
		Multiparous ewes	264	1.212	0.058
	natural meeting	Nulliparous ewes	11	1.545	0.283
		Multiparous ewes	70	1.471	0.112

Parameter	Mating method	Category	N	Mean (%)	±SE
Multiple pregnancies, % (exclude abortions)	**AI**	**Nulliparous ewes**	**36**	**66.67**	**8.049**
		Multiparous ewes	178	65.17	3.620
	natural meeting	Nulliparous ewes	9	77.78	16.09
		Multiparous ewes	68	48.53	5.857

Effect of selected factors on conception rate and prolificacy in ewes subjected to estrus synchronization in anestral season

Factor	F-value and level of significance				
	Conception rate, %	Prolificacy, %	Abortion rate, %	Prolificacy, number of lambs per group	Multiple pregnancies, %
Mating method	5,161*	3,536	3.464*	4.053*	0.082
Category	0,707	1,138	0.430	0.001	2.546
Mating method * Category	1,51	3,536*	0.430	0.218	2.074

***p <0.001; ** p<0.01; * p<0.05

CONCLUSIONS

The applied synchronization protocol, consisting of 14-day intravaginal sponges containing 60 mg FGA and 250 IU PMSG at sponge removal, proved highly effective during the anestrous season, resulting in a conception rate of 81.0% ± 3.71.

The biological prolificacy (number of lambs per lambed ewe) reached 1.72 ± 0.063, and 64.5% of all pregnancies were multiple, including 52% twin, 9.7% triplet, and 0.3% quadruplet lambings. The average number of lambs per ewe in the flock (prolificacy) was 1.34 ± 0.08.

Abortion rate was low (3.7%), suggesting effective pregnancy maintenance under the applied hormonal protocol.

The analysis showed that meeting metod significantly affected reproductive outcomes. A second mating (natural service) led to improved results, particularly in multiparous ewes, where conception increased from 71.2% to 97.14%, and in nulliparous ewes — from 74.07% to 81.82%.

The statistical analysis confirmed a significant effect of meeting metod on conception rate ($F = 5.161$, $p < 0.05$), abortion rate ($F = 3.464$, $p < 0.05$), and lamb output per ewe ($F = 4.053$, $p < 0.05$), while animal category had no statistically significant influence.

No significant differences were found between nulliparous and multiparous ewes in terms of overall reproductive performance, indicating that well-managed yearlings can be successfully bred during anestrus, achieving conception and prolificacy rates comparable to adult ewes.

These findings support the use of hormonal synchronization protocols as a reliable method for out-of-season breeding in Lacaune dairy ewes, facilitating year-round lambing and milk production planning in intensive sheep farming systems.

Thank you for your attention!