

## OBSERVATIONS ON THE DEVELOPMENT OF FETAL ATTACHMENT RETENTION IN INTENSIVELY BREEDING COWS

Petru ROȘCA<sup>1</sup>, Dan DRUGOCIU, Ștefan-Gregore CIORNEI, Florin NECHIFOR

e-mail: [proasca@uaiasi.ro](mailto:proasca@uaiasi.ro), [nechifor.florin@uaiasi.ro](mailto:nechifor.florin@uaiasi.ro)

### Abstract

The evolution of the puerperium is conditioned by the course of parturition - eutopic or dystocic, but also by possible placental retention or uterine atony and not rarely by infection with bacterial germs. After parturition, energy consumption increases with uterine involution, the volume of milk production and the needs determined by local and general self-defence. The puerperal period is one of the most important stages in the reproductive cycle of cows. Early and correct diagnosis of conditions during this period can lead to appropriate and more effective treatment regimens. Research in the literature indicates that special attention should be paid to high milk-producing females, especially in the intensive breeding system, as it is known that some diseases can easily develop in the genital tract during the puerperal period. An important aspect of reproduction in cows is sterility or inability to reproduce due to incurable lesions of the genital tract following dystocic parturitions. The aim of this paper is to complete the existing research and studies in the literature with some major aspects of reproductive pathology in cows, namely to highlight some of the factors that can generate the anaesthesia syndrome. In the first year of observation (2021), the incidence of fetal adnexal retention was 12.4% of the 242 cows monitored, and in 2022 out of a total of 270 cows, 9.6% of females were diagnosed with this condition. Analyzing the incidence of fetal appendix retention by calendar month, it was found that in 2021 no cases were reported in August, one case (0.4%) was recorded in June and July, and the highest level was recorded in February, 2.5%. In 2022, similar incidence of fetal appendage retention was recorded including the highest level of 1.8% being reported also in February. The incidence of fetal attachment retention in cows correlates with the level of milk production per lactation increasing progressively with the volume of milk production. Thus, in the year 2021 in cows with milk production ranging between 5000-5500 liters of milk/lactation the lowest level was obtained, i.e. 0.8% of fetal attachment retention in the herd of 26 monitored females. Of the 45 cows with milk production between 7001-7500 l milk/lactation 3.3% of the females showed fetal attachment retention.

**Key words:** cow, fetal attachment retention, lactation number, puerperal disorders

The puerperal period is a key stage in a female's life, as it is dependent on the course of parturition and any post-partum disorders. Immediately after parturition there is an increase in plastic and energy consumption progressively with uterine involution and milk level/day (2,4).

In order to maintain and increase the level of milk production, which is a commodity on a farm, females should calve at intervals of not more than 12-13 months. Taking into account the average duration of gestation (285 days) and the duration of uterine involution, this means that the time interval for the female to remain pregnant after parturition is quite short (60-80 days) (5, 10). This period overlaps perfectly with the period when the lactation curve is rising. For cows parturition occurred in the spring season, the period of preparation for a new gestation coincides with the period of transition from stock feeding with canned feed to green meal feeding, which is stressful for

the body. The level of milk production together with feed stress can negatively influence reproductive function, manifested by a lack of heat expression over a longer period of time (postpartum anaesthesia) and low fertility rates (6,7). The evolution of the puerperal period in cows is the main segment in the breeding cycle in cows. This. The cyclogram includes monitoring of several stages such as: elimination of lochia, bacteriology of the puerperal uterus, postpartum uterine involution and resumption of ovarian activity (1,3).

In the intensive rearing system, the most common postpartum conditions in the cow are: fetal attachment retention (FAR), postpartum uterine atony, uterine prolapse and endometritis. Nutrition plays a major role in the resumption of ovarian activity after calving and through .proteins synthesized and secreted by adipocytes (8,9).

## MATERIAL AND METHOD

To establish the diagnosis of placental retention and to keep a record of the consultation in the individual gynaecological records of the females as well as the consultation register. The electronic individual gynaecological records provide information on previous parturitions (eutopic or dystopic), puerperal conditions, number of artificial inseminations performed for a new gestation and other treatments performed antepartum, etc.

The history is an important step in establishing the diagnosis of placental retention and provides a range of information on: the breeding programme, the method of artificial insemination or artificial insemination; the forage of the females and the assessment of the quality of the forage, the quantities administered and the method of administration in relation to the physiological condition; the farming technology, movement, rest, microclimate, animal density and hygiene conditions; monitoring of

activities to detect estrus, parturition and puerperium; data on lactation and mammary gland health; frequency of reproductive disorders and abortions; examination of vaginal discharge and reproductive indices.

## RESULTS AND DISCUSSIONS

In 2021, 242 cows were studied, with an incidence of fetal attachment retention of 12.4%. In the following year (2022) out of a total of 270 females monitored, 9.6% were diagnosed with fetal attachment retention.

Cases of fetal attachment retention in cows can be represented by: increased milk production, mammary gland disorders, too short a resting period, poor health status, inadequate quality of fodder fed during gestation, poor hygiene conditions.

Table 1

Dynamics of puerperal diseases in cows in 2021-2022

Year	Cows calved	Retention of fetal appendages		Uterine infections		Ovariopathies					
		nr.	%	nr.	%	Persistent corpus luteum		Hypotrophic ovaries		Ovarian cages	
						nr.	%	nr.	%	nr.	%
2021	242	30	12,4	56	23,1	36	14,8	31	12,8	24	9,9
2022	270	26	9,6	53	19,6	30	11,8	27	10,0	21	7,7
Total	512	56	-	109	-	66	-	58	-	45	-
Media	-	-	11,0	-	21,3	-	13,3	-	11,4	-	8,8

The most common postpartum disorders in cows are endometritis which occur in cases of uterine dynamics disorders expressed by atony or hypotonia following dystopic parturitions, plus the intervention of ascending infections occurring during operations to correct dystocia.

The literature states that the resumption of the uterine-ovarian cycle normally occurs at about 21-45 days, and is dependent on a number of factors such as: age of parturition, quality of feeding, general health of the female, husbandry regime, quality of the microclimate, level of milk production, season, etc. In our study, uterine infections were found to be much higher than fetal

envelope retention, namely 23.1% in 2021 and 19.6% in 2022. The 3.5% lower value of uterine infection frequency recorded in the year 2022 is triggered by providing quality care to the parturition process and administering postpartum preventive therapy.

Analyzing the incidence of ovariopathies it is found that in the year 2021 out of the total 242 females taken in the study, 36 of them i.e. 14.8% were diagnosed with persistent corpus luteum, 31 females i.e. 12.8% were diagnosed with different degrees of ovarian hypotrophy and 24 females, which means 9.9% showed ovarian luteal cystic fibrosis (Table 1, Fig. 1).

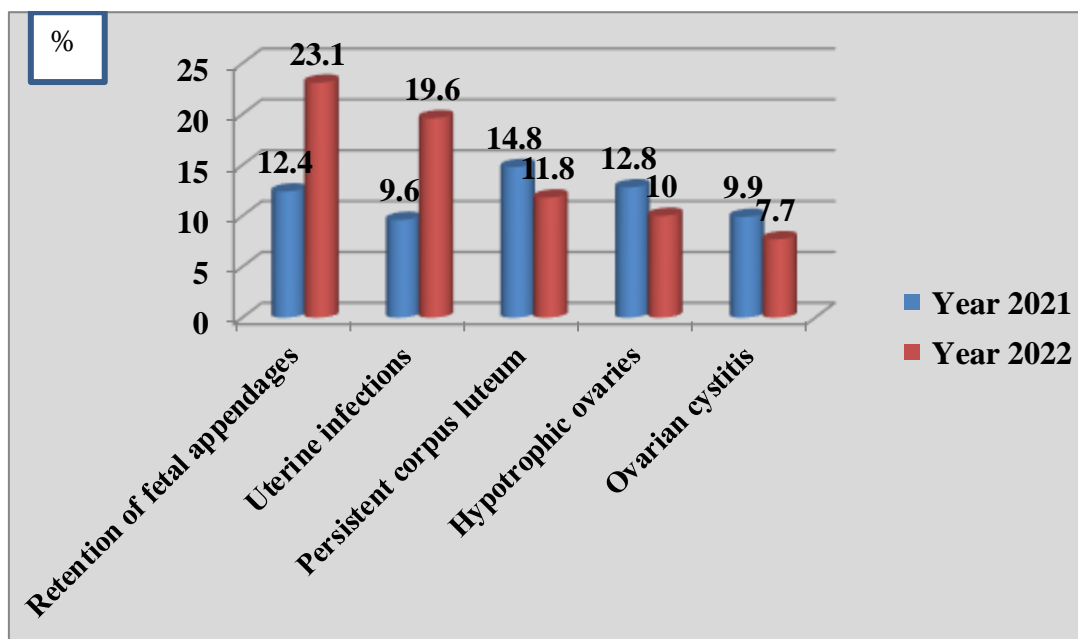


Fig. 1 Frequency of puerperal conditions in the period 2021-2022

The In 2022 out of 270 cows monitored, 30 cows were diagnosed with persistent corpus luteum, representing 11.8% which is 3% lower than in 2021. In the same year there were also decreases in the values of ovarian hypotrophies of different degrees which were reported in 10% of the cases and luteal ovarian cystic fibrosis which were recorded in 7.7% of the cases.

Table 2 presents data on the frequency of fetal adnexal retention recorded in the form taken in the study in the years 2021-2022.

Analysis of these data shows very different values of the frequency of fetal adnexa retention both by calendar month and by season. In the year 2021 the only month in which no cases were recorded was August, while in June and July one case (0.4%) was recorded, in May, September, October and November two cases (0.8%), in January and March four cases (1.6%), the maximum value being recorded in February with 6 cases (2.5%) (Table 2 fig.2).

Table 2

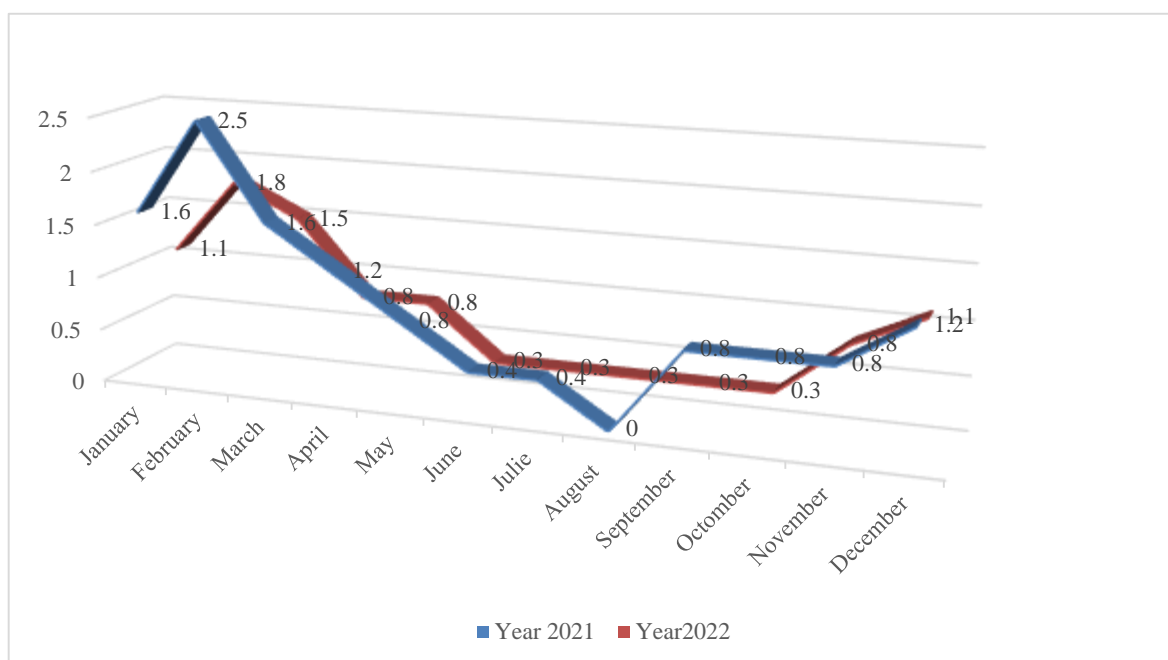
Monthly dynamics of placental retention in 2021-2022

Year Month	2021		2022	
	Nr.	%	Nr.	%
January	4	1,6	3	1,1
February	6	2,5	5	1,8
March	4	1,6	4	1,5
April	3	1,2	2	0,8
May	2	0,8	2	0,8
June	1	0,4	1	0,3
July	1	0,4	1	0,3
August	0	0,0	1	0,3
September	2	0,8	1	0,3
October	2	0,8	1	0,3
November	2	0,8	2	0,8
December	3	1,2	3	1,1
Total	30	100,0	26	100,0

As it results from the analyzed data we can see that the highest values in terms of fetal attachment retention were reported in December-February, so in the cold period of the year, a period when usually the rations administered are unbalanced in nutritional principles and of lower

quality, temperatures can vary greatly and the level of daily milk production remains high.

The retention of fetal adnexa was also similar in 2022, with the highest level also in the cold season of the year and the month with the highest value was also February. (fig.2).



**Fig. 2 Incidence of fetal appendage retention in 2021-2022**

It is known that another factor involved in the incidence of fetal attachment retention in cows is the lactational rank. In this regard it was found that in 2021 out of 57 cows all at first lactation only 1.2% were diagnosed with placental retention (Table 3 Fig. 3). This value increases at 2nd lactation up to 1.6% to reach the maximum level of 3.3% at 6th lactation. Similar but somewhat lower values were also reported in 2022. For example, in cows in first and second lactation, the lowest values were recorded (0.7%)

and the maximum value of 2.6% was also reported in the sixth lactation.

This can be explained by the fact that each lactation is preceded by gestation and parturition, events which bring about a series of changes in the genital apparatus requiring extensive post-partum restructuring.

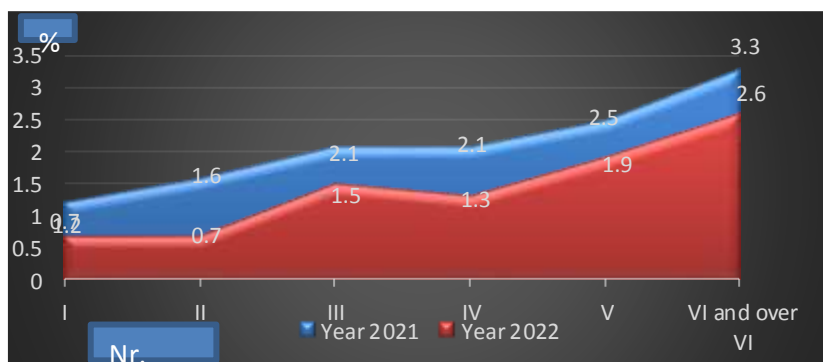
One of the most important factors influencing the development and quality of the postpartum period in cows is the level of milk production.

**Table 3**  
**Incidence of placental retention by number of lactations in 2021-2022**

Laction	Year 2021				Year 2022			
	Parturient cows		Cows with placental retention		Parturient cows		Cows with placental retention	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%
I	57	23,5	3	1,2	61	22,6	2	0,7
II	50	20,7	4	1,6	56	20,7	2	0,7
III	43	17,7	5	2,1	48	17,8	4	1,5
IV	39	16,2	5	2,1	44	16,3	5	1,3
V	31	12,8	6	2,5	34	12,6	6	1,9
<b>VI and over VI</b>	<b>22</b>	<b>9,1</b>	<b>8</b>	<b>3,3</b>	<b>27</b>	<b>10,0</b>	<b>7</b>	<b>2,6</b>
Total	242	100	30	12,4	270	100	26	9,6

The influence of these factors on the evolution of the puerperal period was manifested by an increase in the incidence of fetal adnexa in proportion to the increase in milk production. For example, in 2021, out of the 26 cows studied with a milk production of 5000-5500 litres of milk per

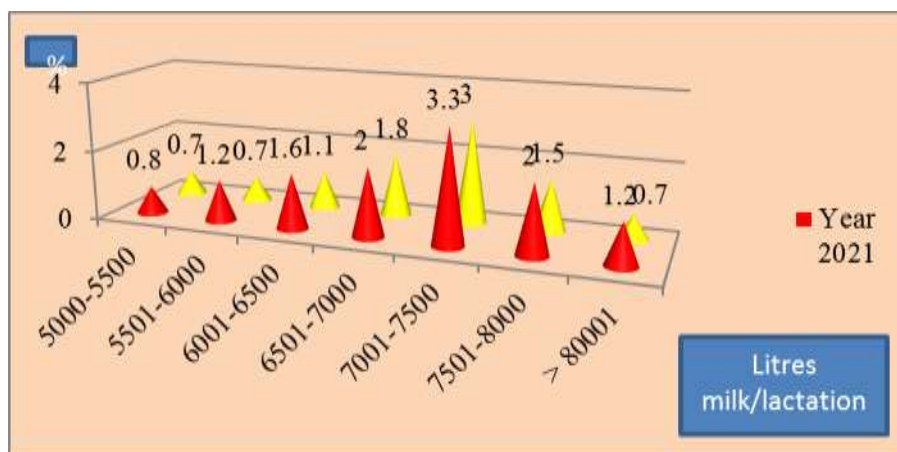
lactation, only 0.8% showed fetal attachment retention, while in cows with a milk production between 7000 and 7500 litres of milk per lactation, this index reached a maximum of 3.3% (Table 4, Fig. 4).



**Fig. 3 Incidence of fetal adnexal retention in relation to number of lactations in the years 2021-2022**

**Table 4 Dynamics of fetal attachment retention in cows as a function of milk production/lactation level in 2021-2022**

Litres milk/lactation	Year 2021				Year 2022			
	Parturient cows		Cows with placental retention		Parturient cows		Cows with placental retention	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%
5000-5500	26	10,7	2	0,8	29	10,7	2	0,7
5501-6000	32	13,2	3	1,2	36	13,3	2	0,7
6001-6500	36	14,9	4	1,6	40	14,8	3	1,1
6501-7000	40	16,5	5	2,0	44	16,3	5	1,8
<b>7001-7500</b>	<b>45</b>	<b>18,6</b>	<b>8</b>	<b>3,3</b>	<b>50</b>	<b>18,5</b>	<b>8</b>	<b>3,0</b>
7500-8000	38	15,7	5	2,0	42	15,5	4	1,5
>80001	25	10,4	3	1,2	29	10,9	2	0,7
Total	242	100,0	30	12,4	270	100	26	9,6



**Fig. 4 Dynamics of fetal attachment retention in cows as a function of milk production/lactation level in 2021-2022**

The season of the last part of gestation and parturition has an important influence on the development and quality of post partum restructurings, on the length of the puerperal period and on the timing of the resumption of the puerperal sexual cycle. The influence of the season is due both to the quality of the feed, which suffers in the cold season of the year as a result of poor preservation methods, and to the microclimate, which is more difficult to ensure at

an optimal level for the comfort and exploitation of the animals.

In the case of our study the influence of the season was demonstrated by recording higher values, namely 3.3% cows with fetal attachment retention in the winter season and 4.5% in the spring season of 2021, the lowest values being recorded in the summer season 2.1% . (Tab. 5 fig.5)

Similar values were also found in 2022, namely proportions of 2.6% in the winter season

and 3.7% in the spring season.

**Table 5**

Incidence of placental retention by season in 2021-2022															
Sezons															
Spring				Summer				Autumn				Winter			
Parturient cows		Cows with R.A.F.		Parturient cows		Cows with R.A.F.		Parturient cows		Cows with R.A.F.		Parturient cows		Cows with R.A.F.	
nr	%	Nr	%	nr	%	nr	%	Nr	%	nr	%	nr	%	Nr	%
38	16,1	11	4,5	95	39,2	5	2,1	50	20,6	6	2,5	59	24,3	8	3,3
44	16,3	10	3,7	10	37,7	4	1,5	58	21,4	5	1,8	66	24,4	7	2,6



**Fig. 5 Incidence of placental retention by season in 2021-2022**

## CONCLUSIONS

1. The evolution and quality of the puerperal course is influenced by many factors that can lead both to the appearance of specific conditions at this delicate period in a parturient's life and to a delay in the resumption of the postpartum sexual cycle.
2. The influence of these factors was reflected in our study in the increased incidence of

fetal adnexal retention and the incidence of puerperal infections in the females studied.

## REFERENCES

1. **Abdela N., Ahmed W. M., 2016.** Risk factors and economic impact of dystocia in dairy cows: A Systematic Review. *Journal of Reproduction and Infertility* 7 (2): 63-74.
2. **Arthur G.N., Noakes D. E., Pearson H., 2009.** *Veterinary Reproduction and Obstetrics*, Ed. Saunders Elsevier, Ed.IX

3. **Beagley, J.C., K.J. Whitman, K.E. Baptiste, J. Scherzer, 2010.** Physiology and treatment of retained fetal membranes in cattle. *Journal of Veterinary Internal Medicine*, 24:261-268
4. **Drillich, M., 2006.** An update on uterine infections in dairy cattle. *Slov. Vet. Res.*, 43: 5–11.
5. **Groza Ioan Ștefan Coordonator, Cenariu Mihai, Ciupe Simona, Ivan Camelia, Morar Iancu, Pall Eموke, Pop Raul, Șonea Alexandru, Voloseniuc Mihai Sorin 2019.** Physiology And Pathology Of The Post-Partum Period In Domestic Animals, Ed. Academiei Române, București.
6. **Nechifor F., Drugociu D., Roșca P., CiorneiȘt. 2016 -** Elemente de patologie în diagnosticul și terapia distociilor la vacă, Ed. Ion Ionescu de la Brad Iași,
7. **Noakes David E., Parkinson J. Timothy, England C. W. Gary, 2019.** *Veterinary Reproduction and Obstetrics* 10<sup>th</sup> Edition, Elsevier,China, pg. 148-153.
8. **Pook S., Horner J., Milhollin R., 2009.** Dairy cattle reproductive manual. Ed. Extension, Missouri.
9. **Runceanu L., Drugociu D., Roșca P., Ciornei Șt., Nechifor F. 2014** –Fiziopatologie materno-fetală veterinară, Ed. Ion Ionescu de la Brad Iași.
10. **Tudor L. 2007** - Reproducția, andrologia și obstetrică animalelor domestice. Ed. Fundației România de Măine, București
11. **Zaabel S. M., Hegab A.R., 2003.** Practical notes on veterinary gynaecology and andrology. Mansoura University.