

RESEARCH ON THE DEVELOPMENT AND THERAPY OF PERSISTENT CORPUS LUTEUM IN COWS

Florin NECHIFOR, Dan DRUGOCIU, Ștefan-Gregore CIORNEI,
Diana-Patricia BĂDIOI, Petru ROȘCA

e-mail: nechifor.florin@uaiasi.ro

Abstract

Pathological puerperium can mainly cause significant economic damage through the high losses that accumulate throughout the herd and especially through the high percentage of sterility and infecundity. According to literature data, it is shown that this infertility ratio can range quite widely between 5.0-30.0% of the total bull herd. A criterion in the occurrence of this gynecological disease is the feed, which can vary in terms of quantity and quality, the farming regime to which the cows are subjected and not especially environmental factors (lack of body hygiene, low temperatures during the winter season and prolonged housing). In both research years, the incidence of cows diagnosed with persistent corpus luteum was high at 7.1% in 2021 and 9.9% in 2022 in the non-lactating cows group and after a period of 90 days after parturition. In 2021 the persistent luteal corpus luteum (CLP) in April did not register any cases, the most significant values were recorded in the months: October (1.9%), November (2.5%), December (3.5%) and the highest level of (3.9%) being reached in January. In 2022 the recorded values of persistent corpus luteum were close compared to the first year of investigation, peaking in January at 3.1%. According to the number of lactations, in 2021, 19.3% females, in 1st lactation only 1.5% were diagnosed with this gynecological condition. Also, the highest level of 4.4% was recorded in cows in their 6th lactation and above.

Key words: cow, persistent corpus luteum, lactation number, pathological puerperium

INTRODUCTION

Today, one of the most important farm animals is the cow, because of the milk yields it produces. Cattle ensure that all human requirements for animal products are met, in particular through the quality and quantity of meat and the level of milk production (1, 2, 5, 9).

Persistent corpus luteum is an endocrine disorder described only in cows, with a key role in the induction of infecundity (3, 4). The name persistent corpus luteum in practice is attributed to that luteal formation which retains its function and size, especially without regressing beyond physiological values (6, 11).

The incidence of this condition can range from 2.0 to 15.0% of infertility cases. The highest incidence is in cattle with high milk yields, especially after parturition during the winter season (7, 8).

This condition can originate from the gestational luteal body or the progesterational luteal body. Persistent corpus luteum can result from the gestational luteal body due to malnutrition or

unbalanced diet as well as in the case of endometrial inflammation (10).

MATERIAL AND METHOD

In this study, we set out to analyse the influence of various gynaecological diseases on the reproductive cyclogram of cattle recorded on the farm, i.e. the causes that can lead to the appearance and onset of genital diseases.

One of the goals we set out to achieve was to find some effective methods of treatment in order to achieve the best possible results. The research was carried out between January 2021 and December 2022 at the unit in the north-east of Moldova.

One of the goals we set out to achieve was to find some effective methods of treatment in order to achieve the best possible results. The research was carried out between January 2021 and December 2022 at the unit in the north-east of Moldova.

The total cattle herd for both years of the study was 428 lactating cows of the Hostain and Red-washed breeds.

The research began with the general clinical examination which consisted of collecting anamnestic information from the gynaecological records on the health status of the female, how the first heat after parturition was conducted, the degree of intensity of the heat, the number of artificial inseminations performed for a gestation, how previous parturitions were conducted, whether the conceived product was full term or whether it was live or dead, and whether complications occurred after parturition.

The diagnosis of persistent corpus luteum was established with certainty on the basis of anamnestic data from the farm register, clinical data (absence of oestrus) and last but not least by gynaecological examination.

To establish the diagnosis of persistent corpus luteum, the operator equips himself appropriately as for the transrectal examination, performing the transrectal examination when he palpates the ovary which is slightly enlarged in volume and identifies the corpus luteum with a spongy appearance, with a diameter of about 2.5 to 3 cm. This examination is repeated at 8-day intervals, performing 3 consecutive examinations every 21-24 days.

The corpus luteum has 3 phases: the organizing phase, the efflorescence phase and the regression phase.

In some females, in the absence of prostaglandin F₂ alpha secretion, the CL after forming and developing does not regress, and on transrectal examination performed for three hours at approximately 10-day intervals maintains its consistency, shape, position and size on the same ovary.

RESULTS AND DISCUSSIONS

On the farm, especially in females with high milk production, the incidence of corpus luteum is common.

Table 1 shows the incidence of persistent corpus luteum in two groups of females, i.e. non-lactating cows that were diagnosed with CLP about 90 days after parturition and non-lactating cows that also showed CLP 90 days after parturition.

In both years of the study, the percentage of females showing persistent corpus luteum was high at 7.1% in 2021 and 9.9% in 2022 in the group of unweaned females and after 90 days post-partum (Fig. 1).

Table 1

Incidence of persistent corpus luteum in 2021-2022

Period	Year 2021		Year 2022		Total	Media
	Nr.	%	Nr.	%		
Number of cows calved	202		226		428	214
Persistent luteal body in females less than 90 days postpartum	18	9,1	16	7,1	34	16
Persistent luteal body in unweaned females over 90 days postpartum	26	12,8	20	9,9	46	23
Total	34	21,7	36	15,9	80	40

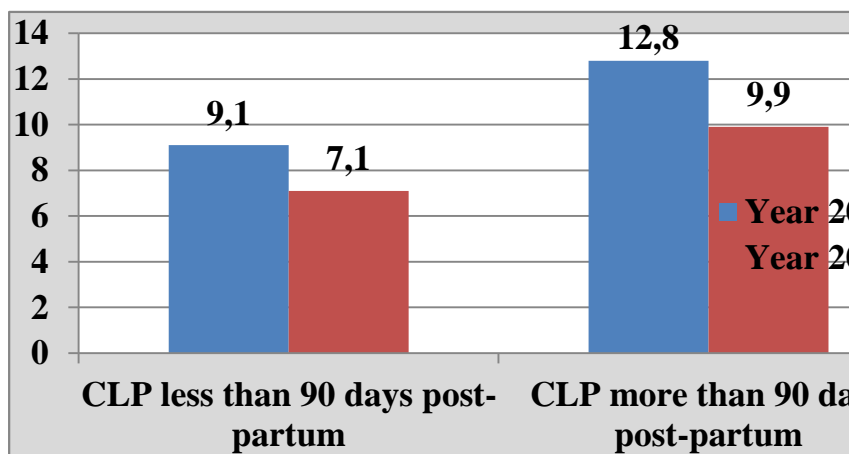


Fig. 1 Incidence of females diagnosed with persistent corpus luteum

According to the literature, after parturition, the heat resumes physiologically at about 21-45 days. On the farm, this criterion varies according to the age of the female, the conditions of

maintenance and exploitation, the general condition of the genital apparatus in particular, the rate of uterine involution, the level of milk production per lactation, balanced feeding in

relation to the physiological condition of the female and, last but not least, environmental factors. For the owner, if this interval is exceeded, it becomes a major problem, as he can no longer achieve his goal of producing one calf per year, and calving-interval values will be very high.

The accumulated data on the incidence of persistent corpus luteum over the two study years (2021-2022) are presented in Table 2. In both study years the values of persistent corpus luteum were higher in the cold months starting in October.

Table 2
Monthly dynamics in cows diagnosed with persistent corpus luteum in 2021-2022

Month \ Year	2021		2022	
	Nr.	%	Nr.	%
January	8	3,9	7	3,1
February	3	1,4	3	1,3
March	2	0,9	1	0,4
April	0	0,0	0	0,0
May	1	0,5	1	0,4
June	2	0,9	1	0,4
July	3	1,4	3	1,3
August	2	0,9	2	0,9
September	3	1,4	3	1,3
October	4	1,9	4	1,8
November	5	2,5	5	2,2
December	7	3,5	6	2,6

In 2021 the persistent luteal body in April did not register any case, in May one case was diagnosed (0.5%) and the highest values were registered in the months: October (1.9%), November (2.5%), December (3.5%) and in January the highest level of (3.9%) of the total herd of females monitored (fig. 2).

In the cold season there were more significant values of females diagnosed with persistent corpus luteum due to deficient rations, poor husbandry conditions and females with high milk yields were not given a specific feed intake according to the milk yield obtained.

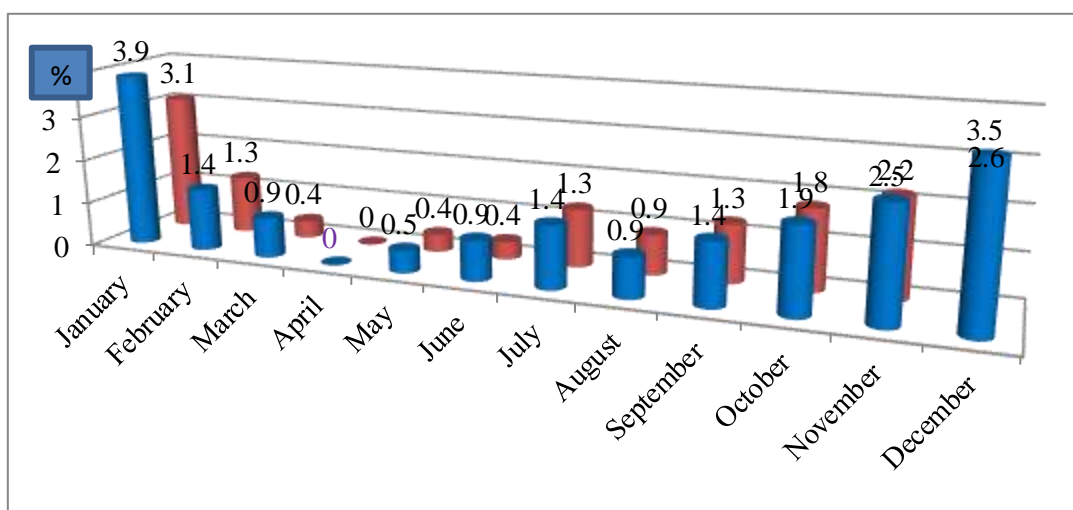


Fig. 2 Incidence of persistent corpus luteum in 2021-2022

In 2022 the recorded values of persistent corpus luteum were similar, with a high level also in the cold season, and in January the highest

percentage of 3.1 was obtained by 0.8% compared to the previous year.

In relation to the number of lactations, in 2021, out of 39 females (19.3) in 1st lactation only 1.5% were diagnosed with this gynecological condition. Table 3 shows the obtained values of persistent luteal body in the years (2021-2022) according to

the number of lactations. Also, the highest level of 4.4% was recorded in cows in their 6th lactation and above (Fig. 3).

Table 3

Lactation	Year 2021				Year 2022			
	Peaceful cows		CLP cows		Peaceful cows		CLP cows	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%
I	39	19,3	3	1,5	43	19,0	3	1,3
II	42	20,8	4	1,9	47	20,7	4	1,8
III	34	16,8	5	2,5	36	15,9	5	2,2
IV	35	17,3	6	3,0	38	16,9	6	2,6
V	29	14,4	7	3,5	33	14,7	7	3,1
a-VI-a and over a VI-a	23	11,4	9	4,4	29	12,8	11	4,8
Total	202	100	34	16,8	226	100	36	15,9

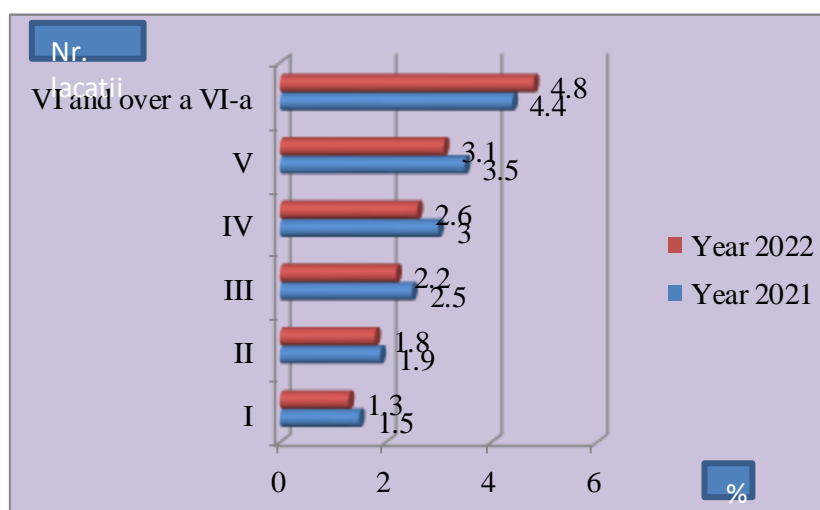


Fig. 3 Incidence of persistent corpus luteum as a function of number of lactations

In 2021, the lowest value of 1.5% was reached in females at 1st lactation and the highest share of 4.4% in females above 6th and above 6th lactation (Figure 7.3).

The frequency of the persistent corpus luteum in relation to the milk yield obtained per lactation increases progressively.

Thus, in 2021 in cows with a minimum milk production between 5000-5500 litres milk/lactation the lowest CLP value of 1.0% of the herd of 202 cows was recorded, and the highest share of 4.4% in females with milk/lactation productions between 7001-7500 litres.

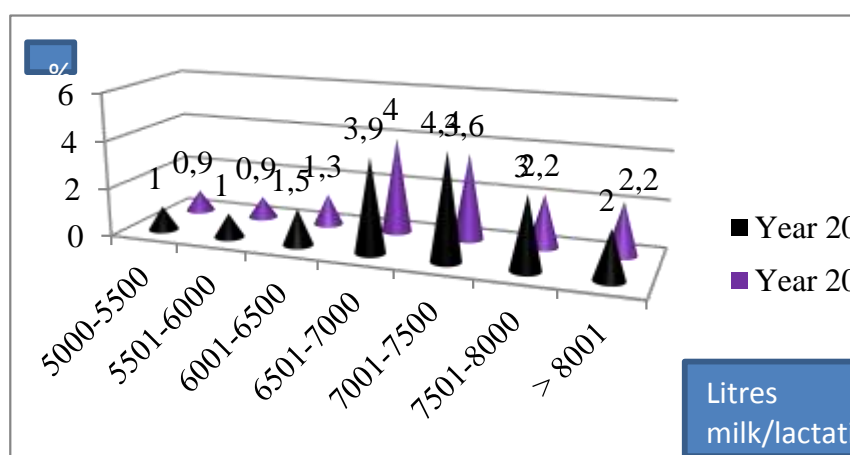
Similar values of this gynaecological condition were also recorded in 2022 with the highest level of 4.0% in females with milk

production/lactation between 65001- 7000 litres (Fig. 4).

Table 4 shows the luteal body values obtained in the two years of the study (2021-2022).

Table 4
Incidence of persistent corpus luteum as a function of milk/lactation level

Litres milk/lactation	Year 2021				Year 2022			
	Peaceful cows		CLP cows		Peaceful cows		CLP cows	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%
5000-5500	19	9,4	2	1,0	21	9,3	2	0,9
5501-6000	24	11,9	2	1,0	28	12,5	2	0,9
6001-6500	30	14,8	3	1,5	34	15,0	3	1,3
6501-7000	34	16,8	8	3,9	39	17,2	9	4,0
7001-7500	36	17,8	9	4,4	40	17,6	10	3,6
7500-8000	33	16,4	6	3,0	36	15,9	5	2,2
>8001	26	12,9	4	2,0	28	12,5	5	2,2
Total	202	100	34	16,8	226	100	36	15,9


Fig. 4 Dynamics of persistent corpus luteum as a function of milk/lactation level

Prophylactic treatment in cattle with this gynaecological condition consists of removing stress factors, feeding them balanced rations in relation to their physiological condition, feeding them high quality feed and ensuring that the females are moved throughout the year.

Curative treatment consisted of administering substances with a rapid action on this gynaecological condition. In this unit, for the treatment of females diagnosed with persistent corpus luteum, PGF Veyx, injectable sol. is administered intramuscularly in a dose of 5 ml. PGF Veyx is also used in cows for parturition induction or synchronisation of heat.

In 2021 following the treatment administered out of the total herd of cows calved i.e. out of 202 heads, 34 females were diagnosed with persistent corpus luteum (16.8%), of these 14.3% responded positively (Table 5).

In 2022, out of 226 calved cows, 15.9% females were diagnosed with persistent corpus luteum and 15.0% were reproductively recovered (fig. 5).

Table 5
Therapy of cows with persistent corpus luteum on the farm

Year	Peaceful cows	Cows diagnosed with persistent corpus luteum			
		Nr	%	Nr	%
2021	202	34	16,8	29	14,3
2022	226	36	15,9	34	15,0

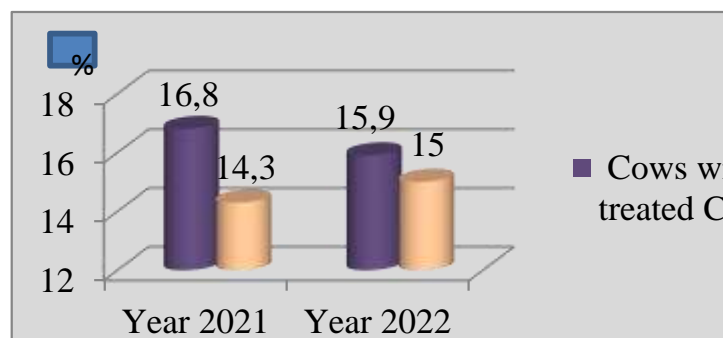


Fig. 5 Farm CLP therapy

CONCLUSIONS

1. The monthly incidence of persistent corpus luteum showed close values in both years of the study. In April 2021, no cases of persistent corpus luteum were diagnosed and the highest value of 4.0% was recorded in January. In 2022, also in April, no females showed this gynaecological condition and in January, out of all surveyed cattle 3.9% were diagnosed with persistent corpus luteum.

2. In relation to the number of lactations, in 2021 the lowest incidence of persistent corpus luteum of 1.5% was diagnosed in females in 1st lactation and the highest of 4.4% in cows in 1st-6th lactation and above. In the year 2022, similar values were found in the same categories of cows with the highest value of 4.8% in females in the 6th and beyond lactation.

3. In relation to the level of milk production/lactation, in both years of observation the persistent luteal body showed an average value of 0.95% in cows with milk production between 5000-5500l, progressively increasing to 4.00% in those with milk production between 7001-7500l.

4. Following treatment of females diagnosed with persistent corpus luteum, 14.3% responded positively in 2021 and 15.0% in 2022.

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*, Saunders Elsevier Publishers, 9th ed.
3. **Ball P.J.H., Peters A.R. 2007** - *Reproduction in Cattle*, Blackwell Publishing Ltd., Oxford, UK

4. **Drugociu Dan, Drugociu Dana Simona 2015** - *Genital and mammary gland pathology in animals*, Ed. Ion Ionescu de la Brad Iasi
5. **Groza Ioan Ștefan Coordinator, Cenariu Mihai, Ciupe Simona, Ivan Camelia, Morar Iancu, Pall Emoke, Pop Raul, Șonea Alexandru, Voloseniuc Mihai Sorin 2019**, *Physiology And Pathology Of The Post-Partum Period In Domestic Animals*, Ed. Academiei Române, București.
6. **Hopper R.M. 2014** - *Bovine Reproduction*, Wiley Blackwell Publishing, USA
7. **Kahn Cynthia M., Line S. 2010** - *The Merck Veterinary Manual*, Elsevier Health Publishing
8. **Nechifor F., Drugociu D., Roșca P., Ciornei Șt. 2016** - *Elements of pathology in the diagnosis and therapy of dystocia in cows*, Ion Ionescu de la Brad Iasi Publishing House,
9. **Nechifor Florin, Roșca Petru, 2020** - *Physiology of the puerperal period and its monitoring in cows*. 2nd edition. Ed. Ion Ionescu de la Brad Iasi
10. **Noakes D, Parkinson T, Timothy J., England G., Gary W. 2019** - *Veterinary Reproduction and Obstetrics 10 th Edition*, Elsevier, China, pg. 148-153
11. **Runceanu L.Gh., Cotea C. 2007** - *Veterinary Reproduction, Obstetrics and Gynaecology*, Ion Ionescu de la Brad Publishing House, Ed.II, Iasi