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TREATMENT OF CYSTIC OVARIAN DISEASE (COD) IN COWS WITH A LOW FERTILITY
II. THE INFLUENCE OF SOME FACTORS ON THE TREATMENT EFFICACY

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The investigations were performed on 935 cows from 5 herds over a 5-year period. 1068 cases of COD were treated. It was found that the efficacy of the treatment decreased with the age of animals and the length of time between calving and the beginning of COD treatment. Furthermore, clinical forms of ketosis, laminitis, mastitis and indigestion influenced markedly the efficacy of therapy irrespective of periparturient disturbances.

Cystic ovarian disease (COD) is one of the serious and frequent disorders responsible for dairy cow infertility (2, 4, 6, 11, 13, 20). The treatment of the disease is managed irrespectively of its ctiology which has not been fully recognized. However, none of the applied methods of COD therapy has claimed superiority (16, 18, 21, 23, 25, 28). Thus, the effect of a few factors on the efficacy of COD therapy was analysed.

Materials and Methods

The investigations were performed on 935 Black-White Lowland cows distributed in 5 herds during a 5-year period. The nutritional and housing conditions of the herds were presented previously (13). In cows with COD one of the six treatment methods described in the first part of this work (14) was applied. The cows were inseminated at the first oestrus after therapy and pregnancy was regarded as a positive result of the therapy. Because the results obtained in this paper showed no differences in the effectiveness of the therapy methods, all the cows were regarded as one group. The following factors were recorded: age, length

of time from calving to the beginning of COD therapy and occurrence of disturbances during calving, puerperium and insemination service period. The results were analysed statistically by means of u test for two differences of two fractions for great statistically number samples (19).

Results

In this study 1068 cases of COD treatment were analysed. COD was found in 53.6% of reproduction cycles and in 77.0% of the cows. The age of the cows was regarded as the first factor which could have influenced the treatment efficacy. However, the results shown in Table 1 indicate that the age influenced the treatment efficacy to a small extent. Significant differences occurred in the cows conceived after the 7th ($u=2.27$) and 8th and further calvings ($u=2.31$). In addition, there were slight differences between the cows not showing oestrus both after the treatment and the 7th and further calvings (Table 1).

The length of time from calving to the beginning of COD treatment was the second analysed factor which influenced markedly COD treatment efficacy (Table 2). The highest percentage of all cows conceived when the treatment began up to 90 days after calving and the differences were significant. However, the highest percentage of the cows showing no oestrus after treatment occurred when the therapy began up to 20 days or more than 90 days postcalving. The differences were significant. In contrast, the lowest percentage of cows which conceived after the treatment operation and insemination service occurred when the therapy began 21 - 40 and 61 - 210 days after calving.

Health disturbances during periparturient and insemination service periods were the third factor affecting the COD therapy efficacy (Table 3).

The reproduction cycles were divided into 4 groups according to the occurrence of the health disturbances. They influenced significantly the COD therapy efficacy. However, the highest percentage of the cows conceived was found in a group A (76.6%) where the cows were healthy clinically and the lowest one in group D (59.8%)where the cows exhibited disturbed calving or period and health disturbances during the insemination service period. The differences were significant ($u=4.40$). In addition, these groups differed markedly in the percentage of oestrus after the therapy (3.6 and 15.0%). However, there were no differences in the percentage of cows conceived between the clinically healthy cows (group A) and both those with normal periparturient period but disturbed insemination service period (group B) and with disturbed periparturient but normal insemination service period (group C). The significant differences in the percentage of cows with no oestrus after the treatment were found between groups A, B and C. It is worthy of note that the calving, postpartum and insemination service period disturbances showed no influence on the remaining fertility coefficients (Table 3).

Table 1

The results of COD treatment in cows after succeeding calvings.

Succeeding calving (group of cows)	1	2	3	4	5	6	7	8 and further
Number of cows	219	202	194	173	131	78	44	27
Number and % of all cows conceiving[a]	170 77.6	162 80.2	147 75.8	126 72.8	94 72.8	52 66.7	27 61.4	14 55.5
Number and % of cows conceiving after 1 treatment and insemination service	41 24.1	34 21.0	27 18.4	28 22.2	21 23.3	17 32.7	7 25.9	3 21.4
Number of cows showing no oestrus after treatment	13 5.9	6 3.0	7 3.6	9 5.2	11 8.4	7 9.0	6 13.6	6 22.2
Mean time from calving to beginning of treatment (days)	76.34	73.31	70.75	69.54	64.53	60.57	65.50	75.11
Mean time from beginning of treatment to oestrus (days)	32.34	36.37	33.39	34.08	32.47	26.25	33.05	40.24
Mean time from beginning of treatment to conceiving (days)	86.28	96.08	94.25	89.71	90.89	87.10	67.33	76.43
Mean number of treatment per conception	2.21	2.35	2.49	2.63	2.39	2.65	2.56	3.36
Mean number of insemination services per conception (days)	3.05	3.20	3.56	3.82	3.53	3.58	3.37	3.29

[a] – significant differences between groups 1 and 7, 8.

Table 2

The results of COD treatment in cows depending on length of time from calving to beginning of treatment.

Group of cows	1	2	3	4	5	6	7	8	9
Time from calving to beginning of treatment (days)	below 20	21–40	41–60	61–90	91–120	121–150	151–180	181–210	over 210
Number of cows	124	347	199	118	92	64	41	33	50
Number and % of all cows conceiving[a]	101 81.5	289 83.3	151 75.9	95 80.5	66 71.7	37 57.8	19 46.3	21 63.6	13 26.0
Number and % of cows conceiving after 1 treatment and insemination service[b]	28 27.7	49 17.0	42 27.8	25 26.3	15 22.7	12 32.4	4 21.1	1 4.8	2 15.4
Number and % of cows showing no oestrus after treatment[c]	8 6.5	8 2.3	4 2.0	3 2.5	6 6.5	6 9.4	8 19.5	5 15.2	17 34.0
Mean time from beginning of treatment to oestrus (days)	41.15	37.41	27.84	31.76	28.40	31.66	32.52	32.14	18.97
Mean time from beginning of treatment to conceiving (days)	91.79	95.12	94.09	78.67	88.20	72.78	87.32	77.90	59.46
Mean number of treatment per conception	2.23	2.24	2.46	2.14	2.44	3.24	3.68	2.76	6.15
Mean number of insemination services per conception (days)	2.82	3.31	3.72	2.89	3.58	3.81	3.95	3.43	5.85

[a] – significant differences between groups 1 and 3, 5, 6, 8, 9;
[b] – significant differences between groups 2 and 1, 3, 9;
[c] – significant differences between groups 2 and 1, 5–9.

Table 3

The results of COD treatment depending on proceeding of calving and postpartum period and insemination service period.

Parameter	Normal calving and postpartum period		Disturbed calving or postpartum period	
	normal insem. service period (group A)	disturbed insem. service period (group C)	normal insem. service period (group B)	disturbed insem. service period (group D)
Number of cows	524	172	235	127
Number and % of all cows conceiving[a]	420 76.7	125 72.7	171 72.8	76 59.8
Number and % of cows conceiving after 1 treatment and insemination service[b]	94 22.4	25 19.7	40 23.3	19 25.3
Number and % of cows showing no oestrus after treatment[c]	19 3.6	7 4.1	20 8.5	19 15.0
Mean time from calving to beginning of treatment (days)	70.98	71.30	64.80	78.17
Mean time from beginning of treatment to oestrus (days)	31.70	36.61	32.26	38.43
Mean time from beginning of treatment to conceiving (days)	86.15	94.20	91.94	98.08
Mean number of treatment per conception	2.27	2.70	2.40	3.33
Mean number of insemination services per conception (days)	3.23	3.30	3.34	4.29

[a] – significant differences between groups A and D;
[b] – significant differences between groups A and B, C, D;
[c] – significant difference between groups A and B, D.

Discussion

The investigation on COD treatment was performed in herds with a high sick rate causing a low level of fertility and a short mean length of cow life.The influence of the cow age on the treatment efficacy expressed in the percentage of the cows conceived contrasted with those reported by Schjerven (23) and Romaniuk (21). However, cows examined by these investigators were in a better nutritional condition, their fertility parameters were higher and the mean length of life was greater.

The influence of the length of time between calving and the beginning of COD therapy on the treatment efficacy confirmed the rule found by others (12, 18, 20, 21, 23). Our results indicated that the highest percentage of conceptions occurred when the therapy began up to 90 d postcalving. In addition, we recorded the lowest percentage of cows showing no oestrus in this time. However, the cows differed from those examined by Romaniuk (21) who found that cows conceived more frequently in the case of treatment 90 - 150 days after calving. Thus, our data are approximated to the results of Robert (20) and Schjerven (23) who found that cows conceived more frequently 60–90 and 21–69 days postcalving, respectively. Consequently, we supposed that cow nutritional level and management were the cause.

Nutrition is a very important factor in keeping up energy balance in dairy cows. It was supported by Dohoo and Martin (7) who found no influence of subclinical ketosis on dairy cow fertilities, but a decrease of its milk yield. Thus, in our experiment negative energy balance could have been the cause of the highest percentage of conceiving and a decrease in milk yield up to 90 d after treatment. The supposition can be supported by insignificant differences between the mean periods from the beginning of treatment to conceiving and the mean number of treatment operations and insemination services per conception (Table 2). However, the relationship between negative energy balance, milk yield and reproductive performance are rather complicated (24, 27, 28).

Data presented in Table 3 indicated that the calving postpartum and insemination service period disturbances influenced significantly COD therapy efficacy and these influences were differentiated.

The lack of differences in the percentage of cows conceiving in groups B and C was a result of normal insemination service period. In addition, slight differences between the mean time from the beginning of treatment to oestrus and to conceiving and both the mean number of treatment operations and insemination services suggested that the treated cows conceived when they reached metabolism balance after calving and a peak of lactation independently of the calving and postpartum period proceeding. The influence of peripartum period disturbances on COD occurrence is well known (10, 13, 17) in contrast to that on COD therapy. Romaniuk (22) showed that the cows affected with retained placenta were exposed to COD more frequently though this exposure depended chiefly on nutritional and management quality.

The analysed disturbances in insemination service period are conditioned by cow metabolism balance (27, 28). Dohoo and Martin (7) pointed out that spontaneous clinical ketosis decreased fertility level. Cows with overfatness are more frequently exposed to health disturbances (5, 8, 16) particularly to rumen indigestion in periparturient period. In the examined herds almost all cows in group D were overfattened during dry period and with a high rate of fat cow syndrome as a result of nutritional faults frequently made by breeders. The phonomenon of insulin resistance to glucose was found in human beings and cattle (1, 3, 15, 25) and it is regarded as one of the symptoms of overfatness. It has caused the polycystic ovary syndrome (PCOS) in women (3, 9). In addition, a high level of free acids in serum is one of the factors contributing to disturbances. Periparturient period causes movement of fat deposits and this process intensifies in high yielding cows when laction rises and during rumen indigestion (27, 28). Our results confirmed the findings of others (5, 16, 26) that nutrition and management are very important factors in maintenance of high yielding cows. Furthermore, they pointed out that the factors play a leading role in COD treatment.

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