Scientific Papers. Series D. Animal Science. Vol. LXI, Number 2, 2018
ISSN 2285-5750; ISSN CD-ROM 2285-5769; ISSN Online 2393-2260; ISSN-L 2285-5750

TRANSITION PERIOD - A NEW CONCEPT USED IN ROMANIAN DAIRY FARMS

Ion Silver MILITARU[1], LiviaVIDU[1], Nicușor ȘERBAN[2], Gheorghe MĂRGINEAN[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest,
59 MarastiBlvd, District 1, Bucharest, Romania
[2]Agroserv Mărițța, Ialomițacounty, Romania

Corresponding author email: liviavidu@gmail.com

Abstract

Dairy represents the most complex type of farming, farmers have the opportunity to develop knowledge and to apply it in farms. Received much attention in the research and popular-based literature in recent years due to the recognition of its importance in the productivity and health of cows. The problem that our research scientists are facing is difficulty in gathering enough cows of similar productivity characteristics in one place to conduct the research necessary to help them understand this animal. Because of this difficulty, we have used animals outside of this short time frame and tried to simulate the same conditions that exist in the true transition cow.

Key words: *conditions, productivity, advantage, healthy, research.*

INTRODUCTION

'Transition period' is not a very commonly used term in Romania. The expression describes the first 21 days before and after calving. The term transition describes the most important physiological, metabolic and nutritional changes. It constitutes a turning point in the productive cycle of the cow from one lactation to the next (Jordan, 2005).

The manner in which these changes occur and how they are managed are of great importance as they are closely linked to lactation performance, clinical and subclinical postpartum diseases and reproductive performance that can significantly affect profitability. This period doesn't have a term used in Romanian animal science literature, but is mentioned as being critical for cows (Jordan et al., 1993)

The three weeks before and the three weeks after calving are an important and vulnerable period for the dairy cow. Her metabolic requirements increase dramatically and how she copes with this high-energy transition period will impact how well she performs during the rest of the lactation. This is why having a good transition cow management program is crucial for a successful dairy operation (Grummer, 1995).

This method allowed us to understand the problems faced by these cows, but has also led to some confusion in interpreting data.

Poor transitions also result in milk income losses (Yokoyama et al., 1994; Markusfeld, 1987).

Every pound of milk lost from peak production represents 90 kg of milk for the lactation. Poor transition periods often result in the loss of 4.5 kg to 9 kg of peak milk (Ferguson, 2001), which could represent 900 to 180 kg of unrealized milk yield. Elaborating nutritional strategies to facilitate the passage of the cow through this transition phase; while minimizing health problems and optimizing productivity/ profitability for the remainder of the ensuing lactation (Cziszter et al., 2013; Markusfeld, 1987).

Physiological changes*:* A number of profound physiologic changes occur in the transition cow that modifies her metabolism drastically.

The rapidly increasing demands of the fetus and the development of the synthesis of milk components, are causing these changes (Grummer, 1995).

The concentration of plasma insulin declines in the transition period until calving and that of somatotropin increases rapidly between the end of gestation and the initiation of lactation.

MATERIALS AND METHODS

Transition period also comes with diseases that can negatively affect the next milk production or total production in the case of heifers.
The conditions described above increase the likelihood of health problems during the transition period (Yokoyama, 1996).
The experiment involved 50 cows that were in dry period, 25 of them were fed only with ration for dry cows until the calving.
The other 25 cows, were fed with the same ration until 21 days before calving, after that they received ration for close-up dry cows (Vidu et al., 2004).

RESULTS AND DISCUSSIONS

Both ration contain water to avoid feeding selection during consumption, because cows have a tendency to consume selective first (Dyket al., 1996). A negative DCAD ration (acidic diet) stimulates the process of calcium resorption from the bones. It is also thought that it allows more calcium to be absorbed from the intestine.

Table 1.The fodder timetable during dry period

Days before calving	Group 1	Group 2	Days before calving	Group 1	Group 2
60	Dry cow Ration	Dry cow Ration	29	Dry cow Ration	Dry cow Ration
59	Dry cow Ration	Dry cow Ration	28	Dry cow Ration	Dry cow Ration
58	Dry cow Ration	Dry cow Ration	27	Dry cow Ration	Dry cow Ration
57	Dry cow Ration	Dry cow Ration	26	Dry cow Ration	Dry cow Ration
56	Dry cow Ration	Dry cow Ration	25	Dry cow Ration	Dry cow Ration
55	Dry cow Ration	Dry cow Ration	24	Dry cow Ration	Dry cow Ration
54	Dry cow Ration	Dry cow Ration	23	Dry cow Ration	Dry cow Ration
53	Dry cow Ration	Dry cow Ration	22	Dry cow Ration	Dry cow Ration
52	Dry cow Ration	Dry cow Ration	21	Dry cow Ration	close up ration
51	Dry cow Ration	Dry cow Ration	20	Dry cow Ration	close up ration
50	Dry cow Ration	Dry cow Ration	19	Dry cow Ration	close up ration
49	Dry cow Ration	Dry cow Ration	18	Dry cow Ration	close up ration
48	Dry cow Ration	Dry cow Ration	17	Dry cow Ration	close up ration
47	Dry cow Ration	Dry cow Ration	16	Dry cow Ration	close up ration
46	Dry cow Ration	Dry cow Ration	15	Dry cow Ration	close up ration
45	Dry cow Ration	Dry cow Ration	14	Dry cow Ration	close up ration
44	Dry cow Ration	Dry cow Ration	13	Dry cow Ration	close up ration
43	Dry cow Ration	Dry cow Ration	12	Dry cow Ration	close up ration
42	Dry cow Ration	Dry cow Ration	11	Dry cow Ration	close up ration
41	Dry cow Ration	Dry cow Ration	10	Dry cow Ration	close up ration
40	Dry cow Ration	Dry cow Ration	9	Dry cow Ration	close up ration
39	Dry cow Ration	Dry cow Ration	8	Dry cow Ration	close up ration
38	Dry cow Ration	Dry cow Ration	7	Dry cow Ration	close up ration
37	Dry cow Ration	Dry cow Ration	6	Dry cow Ration	close up ration
36	Dry cow Ration	Dry cow Ration	5	Dry cow Ration	close up ration
35	Dry cow Ration	Dry cow Ration	4	Dry cow Ration	close up ration
34	Dry cow Ration	Dry cow Ration	3	Dry cow Ration	close up ration
33	Dry cow Ration	Dry cow Ration	2	Dry cow Ration	close up ration
32	Dry cow Ration	Dry cow Ration	1	Dry cow Ration	close up ration
31	Dry cow Ration	Dry cow Ration	CALVING		
30	Dry cow Ration	Dry cow Ration	next 21 days both groups will be feed with fresh cows ration		

Cations are positively charged ions such as sodium (Na+) and potassium (K+) and anions are negatively charged ions such as chloride (Cl^-) and sulphur (S^-).

$$DCAD = (Na + K) - (Cl + S)$$

To see how both rations are functioning on the 42 days of dry period when the second group started to be feed different by first group we are doing a urine test and we will measure the pH (Drackley, 1999).

Table 2. Ration for close up dry cows
(21 day before calving)

No.	The structure of the ration	Content (kg)
1	corn silage	17.00
2	straw	2.00
3	soybean meal	1.20
4	rape-seed meal	1.20
5	alfalfa hay	1.00
6	Triticale	0.50
7	corn	0.50
8	propilenglicol	0.25
9	premix	0.20
	Total	23.85

Close up dry cows period represent the 21 days before calving. Nutritionists appreciate that one cow in close up period need to eat 23.5 kilos per day of TMR (Table 2).

Table 3. Ration for dry cows

No.	The structure of the ration	Content (kg)
1	corn silage	11.00
2	brewers grain silage	5.00
3	straw	1.50
4	rape-seed meal	0.70
5	alfalfa hay	5.00
6	triticale	1.00
7	corn	0.80
8	propilenglicol	0.25
9	premix	0.05
	Total	25.30

Dry cows period during 60 days ahead calving will receive the group number 1 (Table 1). Total forage per day appreciate by nutritionist of farm is 25.3 kilos per day (Table 3).
Both rations are made for a single animal, personalized depending on the physiological state in which it is.

After calving cows will be fed with the same ration and they will be housing in the same barn being carefully supervised by vets. The ration that was given to both groups can be seen in the Table 4.

Table 4. Ration for fresh cows
(21 day after calving)

No.	The structure of the ration	Content (kg)
1	corn silage	14.00
2	brewers grain silage	7.00
3	straw	0.15
4	rape-seed meal	1.50
5	alfalfa hay	0.50
6	triticale	2.20
7	corn	2.00
8	propilenglicol	0.25
9	premix	0.45
	Total	28.05

Figure 1. Cows waiting for calving

A urine pH of 6-6.5 indicates that the rations are well suited for a transition cow. As illustrated in the Table 5, group number 2 has an average of 6.17 that shows that the ration with negative DCAD is well formulated for close-up dry cows, far better than group number 1's ration.
Group 2 has the pH urine average 8.13, alkaline pH who belong to positive DCAD. Urine pH is influenced by cows fed.
Although some recommendations suggest for Holstein lactating cows urine pH within a range of 6 to 6.5.Here's why: showed that if cows' pH fall below about 6.0 or rise above about 7.0, it takes a relatively greater change in DCAD to effect a urine pH change. But when they're within the 6.0 to 7.0 range, a small DCAD change causes a bigger pH jump.

Table 5. Testing the urine pH from both experience groups

Tested cow	Group 1 dry period ration	Tested cow	Group 2-negative DCAD ration
1	8.1	1	6.0
2	7.6	2	6.0
3	8.6	3	6.2
4	7.0	4	6.1
5	7.2	5	6.1
6	7.8	6	6.3
7	8.7	7	6.0
8	8.2	8	6.0
9	8.3	9	6.4
10	8.2	10	5.9
11	7.9	11	6.0
12	8.21	12	6.1
13	8.5	13	6.5
14	8.4	14	6.3
15	8.3	15	6.3
16	8.5	16	6
17	8.1	17	6.2
18	8.3	18	6.2
19	8	19	6.4
20	8.8	20	6
21	8.2	21	6.1
22	8.1	22	6.5
23	8	23	6.5
24	8.4	24	6.2
25	8	25	6.1
Avg.	8.1364	Avg.	6.176

CONCLUSIONS

Although some recommendations suggest for Holstein lactating cow urine pH within a range of 6 to 6.5.Here's why: showed that if cows' pH fall below about 6.0 or rise above about 7.0, it takes a relatively greater changing DCAD to effect a urine pH change. But when they're within the 6.0 to 7.0 range, a small DCAD change causes a bigger pH jump.

A well formulated DCAD ration for close-up dry cows results in increased dry matter intake in early lactation, increased milk production, decreased disease incidence, decreased retained placentas and uterine infection, decreased displaced abomasum, decreased udder edema in heifers and improves reproductive performance.

ACKNOWLEDGEMENTS

This research work was carried out with the support of Agroserv Mariuta.

REFERENCES

Cziszter L.T., Gavojdian D., Popescu D., 2013. Effects of heat stress on rumination behaviour in lactating dairy cows. Proceedings of The Joint East and West Central Europe ISAE Regional Meeting "Behavioral signs for stress and pain in animals", Skopje, Macedonia, p. 44, ISBN 978-9989-774-26-3.

Drackley J.K., 1999. Biology of dairy cows during the transition period: the final frontier? J. Dairy Sci., 82, 2259-2273.

Dyk P., Emery R., 1996. Reducing the incidence of peripartum health problems. Proc. Tri-State Dairy Nutr. Conf., M.L. Eastridge, ed

Ferguson J.D., 2001. Nutrition and reproduction in dairy herds. In: Proc. 2001 Intermountain Nutr. Conf., Salt Lake City, UT, 65-82.

Grummer R.R., 1995. Impact of changes in organic nutrient metabolism on feeding the transition dairy cow. J. Anim. Sci., 73, 2820-2833

Jones W.B., Hansen L.B., Chester-Jones H., 1994. Response of health care to selection for milk yield of dairy cattle. J. Dairy Sci., 77(10), 3137-3152.

Jordan E.R.,Fourdraine R., 1993. Characterization of the management practices of the top DHI milk producing herds in the country. J. Dairy Sci., 76, 3247-3256.

Grummer R.R., 1995. Impact of changes in organic nutrient metabolism on feeding the transition dairy cow. J. Anim. Sci., 73, 2820-2833.

Markusfeld O., 1987. Periparturient traits in seven high dairy herds. Incidence rates, association with parity and interrelationships among traits. J. Dairy Sci., 70, 158-16

Yokoyama M.T., Johnson K.A., 1996. Microbiology of the rumen and intestine. In: The ruminant animal: Digestive physiology and nutrition. D.C. Church ed. Prentice-Hall, Englewood Cliffs, p.1.

Vidu Livia, Udroiu Alina, Bran Mariana, 2004. Study regarding reproduction parameters on Romanian Bleck Spotted cattle from no.4 farm of Research and Development for Agriculture Station –Teleorman. Lucrări ştiinţifice, seria D, Zootehnie, vol.XLVIII, 72-75, ISSN 1582-5876, Bucuresti.