

STUDY OF HOOF TRIMMING IMPORTANCE FOR TRANSITION PERIOD COW

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Abstract

Management of lameness in dairy cows became a big problem for specialists, leading to legislative rules. Lameness has a major impact on health and cow comfort, affecting also the fertility and milk production. While in many instances pain may be difficult to recognize in an animal, lameness is a clear sign that an animal is experiencing pain and discomfort. This study has been performed in Agroserv Mariuța dairy on 50 cows in transition period. In this study was include factors who influence the hoof health, prevention tips, treatment and benefits.

Key words: lameness, hoof trimming, health, dairy, production, fertility.

INTRODUCTION

Hooves are painful diseases with costly treatments, which affect cow productivity and breeding performance. Worldwide, clinical estimates of laminitis prevalence range from 20 to 30%. Estimates of the prevalence of foot lesions found at the cut of the hoof are much higher, ranging from 40 to 70% of cows (Solano et al., 2016). Types of lameness due to foot injuries can be broadly categorized into infectious (digital dermatitis (DD) heel horn erosion, foot rot) and hoof horn (ulcers, white line disease, hemorrhage). Although infectious lesions are the most common type of lesions in most herds, hoof horn lesions are far more costly due to their effects on milk production and culling (Cramer, 2018).

The actual identification and management of the foot diseases of the animals in production is a growing concern of the breeders which has brought to the legislative attention worldwide. All aspects of food production are subject to increased consumer control, as well as animal welfare and rights. While most of the pain is difficult to identify in animals, foot disorders are a clear sign that the animal is suffering and has a discomfort. Because of this at the industrial level, farms are committed to reducing the incidence and severity of foot-and-mouth disease. The result of this activity

will materialize at the farm level by increasing milk production, reducing reformed animals from pedal causes and increasing profit (Burgi, 2016).

Foot conditions are a big challenge, being a problem of the same magnitude as the problems at the level of the udder. Specialized studies can identify the main factors that cause this problem.

The high density in the stable, if there are too few cushions for the number of cows in that group, the cow will not find a clean place to rest, and then she will choose to sit on an unpaved, dirty place which may increase the incidence of cows. There were problems with the tabs. Group exchange increases the risk of foot infections. Also in this category we include the poor quality of the area.

Although it is desirable for the cow to have a large production, it is precisely her effort to produce much milk that leads to combined problems of the udder and the tabs. The pressure on the cow's body to produce milk creates a metabolic stress that will decrease the immunity (Baraitareanu and Vidu, 2019).

One of the main factors is the genetic one, the podal problems are inherited, it is desirable to eliminate these cows from the herd, as well as their descendants. Too high the protein-energy level in the feed ratios increases the incidence of interdigital disorders.

Foot baths made incorrectly or rarely will affect the health of the feet. Incorrect treatment of problems and poor management of a regular trimming will lead to an increase in the number of animals suffering. The biggest problem is not the treatment but the identification, the farmers underestimate the problem, a good management can lead to the significant reduction of reformed animals due to the pedal problems.

More specifically, body condition score (BCS) and the thickness of the digital cushion (DCT) have been identified as risk factors for lameness. Studies conducted in the UK have shown that a decrease in BCS, or a low BCS, increases the risk of lameness (Randall et al., 2015). Studies done in a single herd in New York, USA have shown that there is an association between DCT and lameness (Machado et al., 2011; Cramer, 2018).

In order to identify the laminites we will have to visualize how the cow goes, so its gait and body position during the gait is framed in a scale. In order to facilitate the work of the farmer, different devices appeared on the market that estimates the activity, the corporal position, announcing the farmer of the possible problems. (4d4f).

Burgi (2016) explains that during the transitional period the cow goes through hormonal, metabolic and behavioral changes, which can influence the predisposition for foot conditions. Integration after calving in a new group or in a new shelter (another type of floor, another type of couch, etc.) can be a stress factor, which causes it to spend more type standing. Therefore, this position can exert additional pressure on the limbs as well as on the bloodstream.

Also, during the pre-partum period in the body of the cow a complex of hormones is elaborated, which have the role of relaxing the ligaments of the pelvis, including those of the hind limbs.

Particular attention should be paid to the period of close-ups, because the decrease in dry matter intake during this period leads to the deterioration of the health condition during the fresh cow period. For example, ketosis and abomasum dysplasia may occur.

Most cases of floor-laminate disorders occur from 45 to 70 days after calving or during the

transitional period. The diseases overlap with the increase of milk production, it is difficult to treat, and prevention is recommended. It is recommended that each cow be evaluated 8 weeks before calving, and during each year, each cow is evaluated 2-3 times (Burgi, 2016).

MATERIALS AND METHODS

This work aims to bring to the farmers an authentic problem and that by treating it will significantly increase milk production. Nowadays due to a massive demographic increase and the increasing degree of poverty, the main food sources increase their volume. In the case of dairy farms, the desire of the farmer everywhere is to increase milk production, the economic variant being to increase the quantity of milk per cow head, a main factor leading to this is the creation of animal welfare. This paper, by the method presented aims to raise awareness of the importance of trimming in milk cow farmers during the post-partum transition period.

For the present experiment, 50 cows were selected during the second lactation, 25 of them were sent in the first 21 days after the fetus and the other 25 were sent when they had problems at the foot level. Both groups of animals were treated by the same technician using the same containment stand and the local treatments.

The animals chosen for genetic study are similar, their mothers performed on average with a production at 305 days of 12,500 kg milk. The experiment was conducted within the dairy cow farm SC AGROSERV MARIUTA SRL from Ialomita county, Romania. The study started in March 2018 and was completed in March 2019, the animals analyzed were monitored during the second lactation.

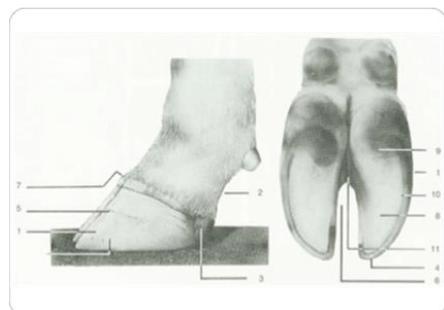


Figure 1. Conformation of the foot (veepro.nl)

The conformation of the foot:

1. The horny wall of the claw.
2. The pastern.
3. The heel or bulb.
4. The weight-bearing border of the wall.
5. Growth rings.
6. The interdigital space.
7. The coronet.
8. The sole; if the claw is healthy, the thickness is 5 to 7 mm.
9. The solar part of the heel; the weight-bearing part of the heel.
10. The white line; the horny connection between the weight-bearing border and the sole.
11. The interdigital skin.

The working protocol was as follows:

The animals entered in the protocol of those controlled in the first 21 days after feeding, is a well-organized protocol so the animals between 15-30 days after feeding will enter the contention stage daily and will be subjected to the first clearing of the lactation. Those found with problems and needing a check-up will return to the stand within 5 days of diagnosis. The process will be repeated from 5 to 5 days until the area is healed.

The product used mainly for the cows studied is PODODERMIN. It involves a local treatment that acts with the specific, synergistic bactericidal effect of oxytocin, Nitrofan, Iodoform and bismuth, which acts against gram positive and gram negative germs, as well as by the keratolytic and scarring effect of salicylic acid. The specific smell removes insects.

The drug is of a creamy, solid consistency. Due to the chemical composition, it is used with gloves. The product is placed on a sterile phase in an amount of 5-10g, then this phase is placed on the affected area at the level of the tabs and then for fixing them will bandage the tab.

This treatment will be repeated every 5 days so the phase and bandage will be replaced and the operator will be able to review the affected area. If this is healed then no further action will be taken.

Depending on the severity of the tab problem, the operator may attach prosthesis. This prosthesis is made of wood and with the help of special glue it sticks to the healthy nail thus helping the diseased and deep cleaned to regenerate (Figure 2).

Table 1. Rations used differentially for the transition period

RATION STRUCTURE	CLOSE UP	AFTER CLOSE UP
CORN SILAGE	18	30
ALFALFA SILAGE	6	14
STRAW	0.5	
SOYBEAN MEAL	1	3
CORN	2.8	5
PREMIX 1		
PREMIX 2	0.2	0.3
PREMIX 3	1	
ALFALFA HAY	1.5	1
WHEAT	1.5	3.2
LIN SEED	0.4	1
CORN GLUTEN	1	1
DEXTROZA	0.3	
RUMEN PROTECTED FAT	0.3	0.4
RUMEN PROTECTED SOYBEAN MEAL	1	0.5
MONOCALCIC PHOSPHATE	0.1	0.1
Mg OXIDE	0.05	0.08
SODIUM BICARBONATE	0.2	0.2
MONOPROPILEN GLYCOL	0.3	0.3
SOYA HULLS	1	1.5
SALT		0.1
CALCIUM CARBONATE		0.1
WATER		2



Figure 2. Wood prosthesis

RESULTS AND DISCUSSIONS

Foot conditions most often occur during the transitional period, when the animal is under very strong pressure. During this period the milk cow is in the phase of ascension of the lactation or of the mobilization of the corporal reserves.

From the observations I found that there is a decrease in body weight by 5-8% compared to the one born at birth (weight loss occurs on account of body fat and less protein); appetite is low and capricious (the intake is lower by 45%), slow growth dynamics (4-5 months), in the case of poor quality feed and more

pronounced (2-3 months) in the case of good quality feed.

Also, it is known that the nutritional balance especially the energetic one is negative, in the first two months after calving (-0,23 UN); the lactation curve is ascending (40% of the milk production is done); the reproduction activity is null in the first 2 months, with the gestation settling towards the end of the phase.

Table 2 presents the trimming interventions for 25 cows in the first days after calving. It can be observed that the average of the intervention interval is 18.4 days. In 56% of cases, a second intervention was needed in a range of 3 to 150 days, with an average of 61.71 days.

Table 2. Podotechnical events appeared for the group sent in the first 21 days after the facade

Animal	Birth date	Trimming date	Days in milk	Trimming control	Quantity of milk from the trimming day	Milk quantity after 15 days from trimming
1	5/11/18	5/30/18	19	9	40,9	42,1
2	9/15/18	10/4/18	19	77	41,5	42,7
3	1/23/19	2/3/19	11	3	41,1	40,2
4	5/25/18	6/13/18	19	55	41,3	40,5
5	7/5/18	7/17/18	12	150	41,3	42,1
6	8/3/18	8/25/18	22		41,3	41,2
7	8/11/18	9/6/18	26	105	41,4	41,9
8	1/8/19	1/31/19	23		41,5	37,3
9	11/11/18	11/26/18	15	24	41,7	40,3
10	12/12/18	12/24/18	12		41,8	41,3
11	2/1/18	2/22/18	21		41,9	40,9
12	9/13/18	10/6/18	23	54	42,1	42,1
13	9/17/18	10/8/18	21	112	42,3	42,3
14	1/31/19	2/21/19	21		42,4	41,0
15	10/18/18	11/8/18	21		42,5	40,4
16	9/3/18	9/21/18	18	136	42,5	41,3
17	11/5/18	11/25/18	20	25	42,5	41,7
18	12/5/18	11/25/18	19		42,9	41,9
19	12/7/18	12/19/18	12		43,0	41,2
20	1/16/19	1/25/19	9	11	43,0	41,1
21	1/30/19	2/14/19	15		43,3	39,4
22	12/30/18	1/16/19	17		43,4	41,0
23	12/9/18	12/29/18	20		43,6	41,0
24	10/27/18	11/20/18	24	29	43,9	42,4
25	9/16/18	10/7/18	21	74	43,7	42,9
		X=18,4 days	X= 61,71 days	X=42,23 kg milk/day	X=41,18 kg milk/day	

The genetic potential of all the animals chosen for the experiment is similar, as shown in 43.3. The animals in Table 3 were treated after the problem was identified. Thus podotechnical operators from human error could omit certain animals.

„Thus, animals with foot problems may have difficulty walking and also all of them lead to a gradual decrease in milk production. Foot problems draw down the genetic potential of animals, which cannot manifest their true genetic value.

Table 3. Podotechnical events that appeared for the trimmed group when problems occur

Animal	Birth date	Trimming date	Days before calving untill first trimming	Quantity of milk from the trimming day	Milk quantity after 15days from trimming
101	11/9/18	12/13/18	34	24,1	32,7
	1	12/19/18			
	2	1/18/19			
	3	1/22/19			
	4	1/26/19			
	5	1/30/19			
102	3/2/18	4/10/18	39	17,7	32,1
	1	4/16/18			
	2	4/19/18			
	3	5/29/18			
	4	8/7/18			
	5	12/01/18			
103	1/23/19	2/3/19	11	17,0	32,1
	1	2/8/19			
	2	2/19/19			
104	7/11/18	8/17/18	37	15,9	32,1
	1	8/2/18			
	2	8/6/18			
	3	10/17/18			
105	10/25/18	12/18/18	54	17,2	33,2
	1	1/7/19			
	2	1/11/19			
	3	1/15/19			
	4	1/19/19			
	5	1/30/19			
106	11/28/18	12/29/18	31	18,3	30,1
107	8/15/18	11/22/18	99	17,5	32,5
	1	9/6/18			
108	11/11/18	12/22/18	41	15,8	35,1
	1	12/19/18			
	2	2/2/19			
109	1/15/18	2/28/18	44	19,2	32,1
	1	3/6/18			
	2	5/30/18			
	3	8/7/18			
110	6/2/18	8/13/18	72	18,8	32,8
	1	1/20/19			
	2	1/29/19			
	3	2/4/19			
	111	12/19/18	3/10/19	81	16,3
1		1/15/19			
112	8/31/18	11/18/18	79	16,1	35,4
	1	9/13/18			
	2	9/19/18			
	3	12/20/18			
113	12/2/18	1/25/19	54	17,0	33,7
	1	12/14/18			
	2	12/19/18			
3	2/2/19				

114	1/1/18	2/27/18	47	18,8	35,1
	1	3/29/18			
	2	4/3/18			
	3	5/29/18			
	4	6/8/18			
	5	7/18/18			
	6	7/30/18			
7	8/10/18				
115	1/12/18	5/29/18	137	17,6	33,3
	1	1/14/19			
116	3/17/18	6/27/18	102	20,3	33,5
	1	6/3/18			
	2	8/14/18			
	3	2/4/19			
4	2/8/19				
117	1/25/19	5/7/19	102	17,7	33,5
	1	1/17/19			
	2	1/21/19			
3	2/5/19				
118	1/6/19	4/6/19	90	19,4	33,7
	1	1/26/19			
2	2/2/19				
119	9/15/18	12/17/18	93	19,4	33,7
	1	12/20/18			
120	3/17/18	5/21/18	65	17,5	35,0
	1	3/23/18			
	2	3/27/18			
	3	3/31/18			
	4	5/22/18			
	5	6/5/18			
	6	8/13/18			
7	10/17/18				
121	11/17/18	1/18/19	62	19,6	31,2
	1	2/2/19			
2	2/6/19				
122	8/3/18	11/5/18	94	19,0	33,9
	1	10/17/18			
	2	12/20/18			
3	1/31/19				
123	11/28/18	1/4/19	37	17,0	35,6
	1	1/9/19			
2	2/2/19				
124	8/20/18	12/13/18	115	19,1	35,4
	1	12/22/18			
2	12/25/18				
125	6/19/18	10/10/18	113	20,1	40,1
	1	7/30/18			
	2	8/13/18			
	3	8/24/18			
	4	9/26/18			
	5	10/2/18			
	6	10/4/18			
	7	10/19/18			
	8	11/2/18			
9	12/20/18				
				X=18,22 kg milk/day	X=33,79 kg milk/day

If for the first experimental group the trimming was compulsory after calving, in the first month, for the experimental group 2 (Table 3) the trimming intervention was performed when a problem was observed in vacuum; in most cases difficulty walking.

In Table 2 we can see that the cows that were sent in the first 21 days required between 1 and 2 check visits, while the group sent when the animal already had pain had an average of 4.44 controls. The visits to the podiatry stand were more frequent, some requiring only 2 visits, while others of 9 visits to cure the problem.

The dynamics of milk production for cows that gave birth during the same month (March 2018), and the identification of acute pod

problems was carried out in a period of 25-40 days. Each cow returned to control 3 times. Thus, the average daily quantity at the time of identification of the problem was 24, 1 kg milk, after tartar at control 1 the production increased to 47 kg, but also against the background of the normal ascending production curve. At the second control, the average quantity of milk increased to 52 kg, and at the last control the production was in the downstream phase (38 kg milk per day). Careful treatment of sprouts has limited their influence on milk production, cows following the normal lactation curve. To prevent the occurrence of foot disorders, measures are required, such as:

- hygiene of the shelters, by keeping the surfaces of the shed clean and dry;
- bathing the feet of the cows at the milking room, by maintaining the same bath for a period of 2-3 days;
- periodic trimming, at least 2-3 times a year;
- the rations of the dairy cows during the transition period are energy-protein balanced, the frequency of their modification is reduced, the content of good quality fats is ensured according to the nutritional requirements, in the breast rest period (the dry period) the ration content in concentrates are reduced, even until the total removal of ration, and after calving the content of concentrates gradually increases, the addition of Zn in ration has favorable effects on the skin and its resistance to diseases at its level; the improvement of the animals in the direction of obtaining some animals with strong structure, with correct aplomb and resistant to the foot afflictions.

CONCLUSIONS

1. The animals from the first experimental group entered the mandatory trimming protocol in the first 21 days after feeding, respectively an average per group of 18, 4 days, which led to the rapid identification of the pedal problems, the preventive treatment and the reduction of costs with late treatments, with veterinary staff called for intervention. Also, the interval of return to trimming was reduced, being 61-71 days, a period that falls within the current recommendations of the specialists.
2. The animals from experimental group 2 entered the trimming protocol as needed, which

led to an increase in the number of interventions up to 9 during the second lactation.

The average milk production in the 25 cows was 18.22 kg milk, and after 15 days from the intervention the average milk production stood at 33, 79 kg milk per cow.

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