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Monitoring of Orthopedic Diseases at Cows.

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ABSTRACT

Now diseases of hooves of cattle on the caused damage are high on the list in pathology of adult animals of this look, the highly productive dairy cattle most of all suffers. Results of dynamics of prevalence of diseases in fingers at cows of black and motley and simmentalsky breeds, and also researches of morfo-biochemical indicators at sick and clinically healthy animals are given in article. The main causes of purulent necrotic lesions of the distal extremities in cattle Black and white and Simmental in the surveyed farms are a violation of technology, feeding, lack of hygiene standards, as well as the lack of systematic preventive clearing and trimming of hooves of the cows.

Keywords: purulent pododermatita, crumb ulcer, cattle, medical examination

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INTRODUCTION

Nowadays the number of limb diseased animals, especially of high-producing cows, doesn't decrease by different management technologies on large Russian livestock farms, and on the contrary it increases [16].

According to a number of authors [1, 3, 5-9, 11] on some farms claw disorders which seriously damage economic have 30…87% of cows. In particular an average daily milk production is reduced by 28% to 42% [2, 10, 17], a service period is extended, a calf crop during the year is reduced by 18% [9, 11, 18], a premature culling of diseased animals is by 50…60% [6, 12, 15]. Additionally a rotation of livestock increases, selective stock breeding program is affected which doesn't allow to realize the breed's genetic potential and reduces the branch profit [4, 13]. Claw disorders of high-producing cows are the crucial issue of livestock farming [14]. Problem of cattle's distal part limbs diseases exists also in other countries [19-52].

The objective of this work is to research a prevalence rate of cattle's digital purolo-necrotic disorders on some farms of Ulyanovsk district, Russia.

Research technique:

Prevalence and nature of distal part limbs diseases was researched in black pied cattle on the agricultural production cooperative "Krasnaya Zvezda Ltd." of Ulyanovsk district, where about 730 cows were kept during the year, in Simmental cattle on the agricultural production cooperative and collective farm "Rodina" of Veshkaima district, where about 340 cows were kept, and also in black pied cattle on the peasant farm enterprise "Vozrozhdenie Ltd." of Cherdaklinskiy district, where 133 black pied cows were researched. All diagnosis results were registered in case reports. Cattle were kept in standard tie-stall barns.

Research and status lokalis description of cows having digital purolo-necrotic disorders was performed according to the following order: an animal was examined at rest with consideration for limbs position and direction, claw structure and form. The attention was focused on the size and deformation degree of diseased claws, on swelling size and wounds present on the coronary band, on hoof wall condition and presence of fissures, clefts, ripples, roughness and other disorders. The attention was paid to a hoof sole and particularly to its convexity or concavity degree, condition of subunguis and sole horn. Ill-health, tissues density and current temperature was determined by means of palpation. Additionally an animal was walked around the illuminated area of the farm and degree, type of its lameness was taken into account.

A nature of exudate that filters into area of abnormal focus, its amount, colour, odor and viscosity also were considered.

Blood of healthy cows and cows with orthopedic disorders was analyzed. Blood samples for hematological study were taken from the jugular vein in the morning before feeding.

Red blood cell count, haemoglobin contents, mean corpuscular volume, mean corpuscular haemoglobin, mean corpuscular haemoglobin concentration were calculated by automated blood-cell analyzer PCF-90-Vet. White blood cells of animals were counted in Goryaev's chamber (dilution 1:20). Acoustic computer-controlled BIOM analyzer AKBa-01 has determined amount of total protein, albumin, α-, β-, γ-globulin. Numerical results were statistically processed by software "Statistika 6".

RESULTS AND DISCUSSION

On the agricultural production cooperative "Krasnaya Zvezda Ltd." with total amount of 727 black pied cattle initially examined, purolo-necrotic disorders of limbs distal part were diagnosed by 539 cows (74.1%) with 890 detected disorders. Later after preventive and curative interventions cow's claw diseases were diagnosed by 329 cows (45.3%) with 524 detected disorders. By researching of claw disorders nature we have determined that this disorder has varied within the following range: skin ulcer of interdigital cleft wall – 41.95…74%, purulent pododermatitis 12.98…33.3%, subunguis ulcers 5.0…14.2%, tylomas 6.6…11.52%; Rusterholz ulcers, coronary band ulcers, laminitis, fissures, wounds, subunguis dermatitis and other diseases were represented in small amounts compared to all purolo-necrotic disorders of limbs distal part.

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Similar type of claw diseases was detected in Simmental cattle on the agricultural production cooperative and collective farm "Rodina" of Veshkaima district. Clinical orthopedic health examination has detected that 230 cows had claw diseases with 351 detected disorders and these cows take 67.7% from total livestock number. By next examination of Simmental cattle it was determined that after preventive and curative interventions cow's claw diseases were diagnosed by 49 cows (14.4%) with 91 detected disorders. In the milking herd of Simmental cattle following disorders of limbs distal part were diagnosed: subunguis ulcers – 41%, skin ulcer of interdigital cleft wall – 34%, pododermatitis - 8%, coronary band ulcers, interdigital dermatitis – 8%, coronary band phlegmons, arthritis, tylomas, wounds and other diseases were represented in small amounts compared to all claw disorders. Results of the clinical orthopedic health examination on the peasant farm enterprise "Vozrozhdenie Ltd." of Cherdaklinskiy district help to determine that 71.4% from total livestock number (or 95 cows with 179 detected disorders) had limb diseases. Among the detected purolo-necrotic disorders of limbs the following diseases are most prevalent: skin ulcer of interdigital cleft – 39.1%, purulent pododermatitis – 19%, subunguis ulcers – 19%, Rusterholz ulcers – 13.4%, tylomas – 3.9%, wounds, ulcers and phlegmons of the area near coronary band – 3.4%.

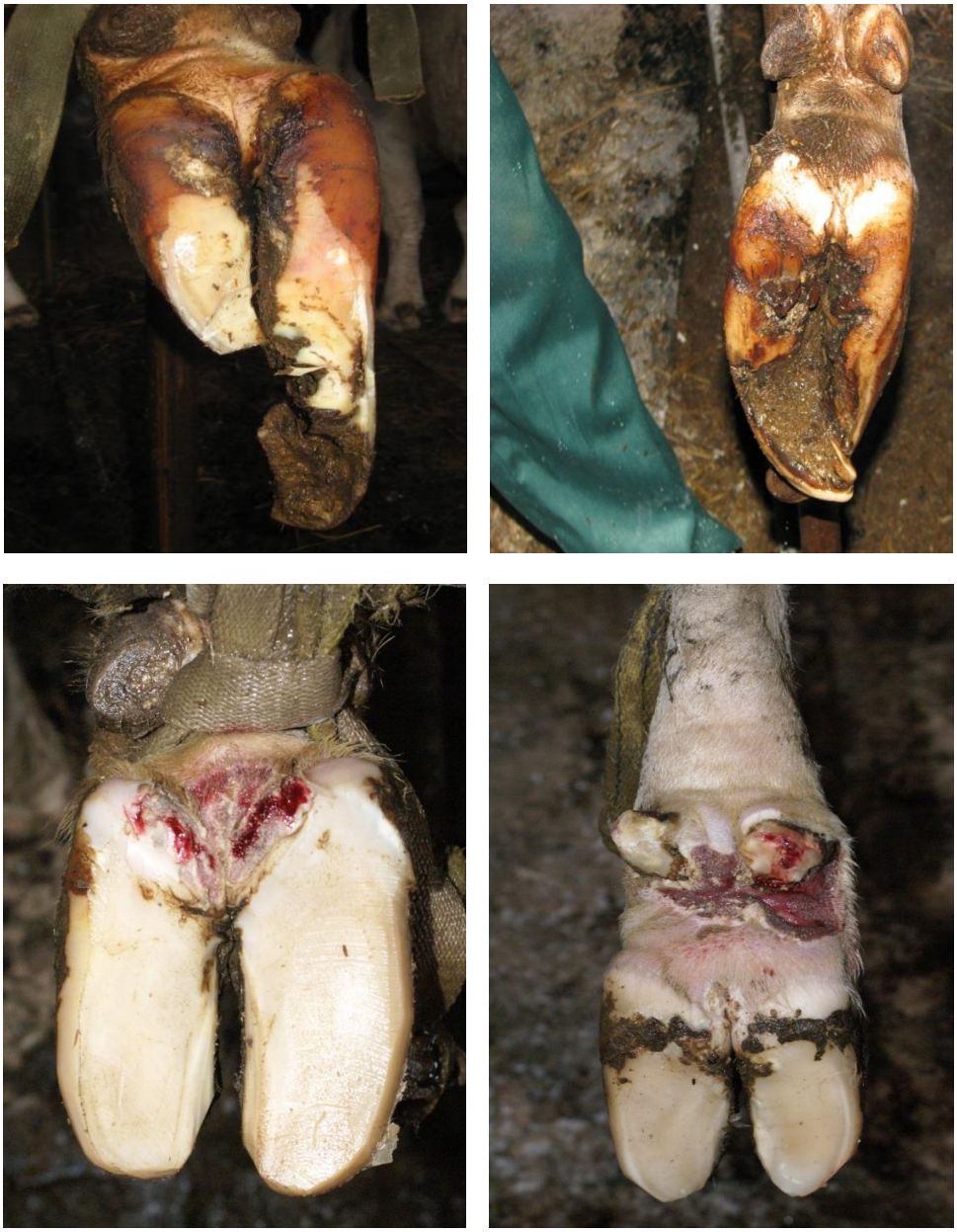

Fig 1 – Ulcers of cattle claws

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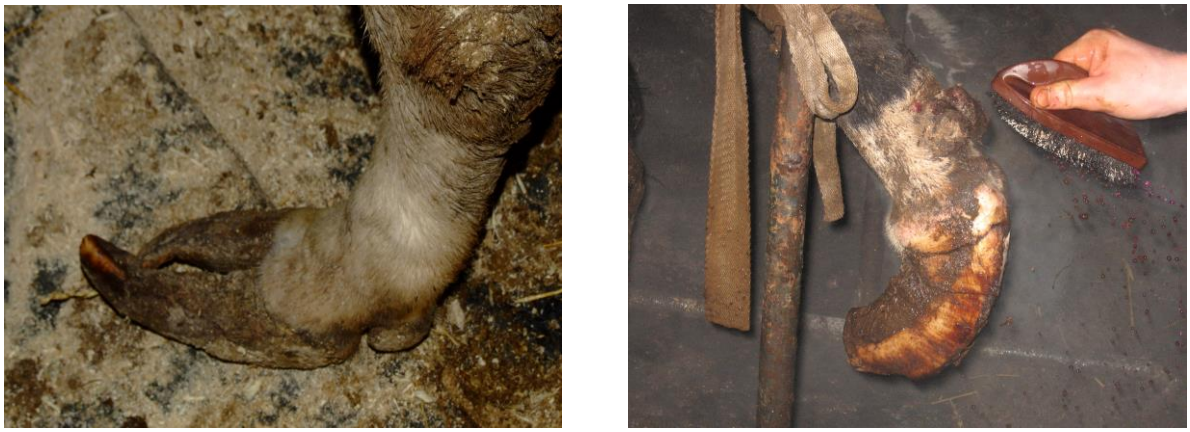
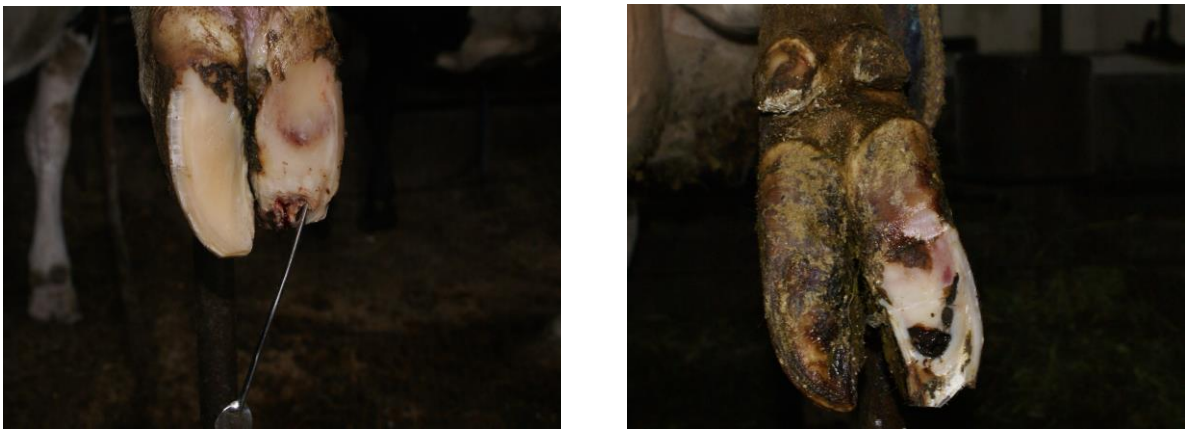
By researching symptoms of cow's digital disorders the following data were determined: by ulcers (of interdigital cleft, coronary band, subunguis, supernumerary digits) different defects were diagnosed (figure 1). All cows had medium severity weight bearing lameness and bore their weight on toe; claws were deformed (generally acute-angled). Ulceration forms were different: from abnormal oval-elongated form to rounded form. Surrounding tissues of defects were tense, swollen, painful and hyperemic. Ulcer surface was rose-red, covered with mucopurulent exudate having characteristic odor, it had areas of grey necrotic tissues with small blood amount. General condition of cows was depressed, appetite was reduced.



A



B

Fig 2 – Cattle's purulent pododermatitis

А – claw horn deformation; Б – pathological grooves of claw toe and sole.

Animals with purulent pododermatitis (figure 2) lied most of the time, their general condition was depressed, hyporexia and hyperthermia were diagnosed. By movement the severe weight bearing lameness of diseased limbs was appeared.

Excessive growth and deformation of the claw horn were diagnosed. By palpation the coronary band tissues were tense, swollen and painful.

By an orthopedic and surgical debridement of diseased limbs claw horn defects were found infiltrated the base of claw skin, in the form of narrow grooves with purulent exudate filtering from them and foul odor.

Analyzing hematological data it was determined that red blood cells contents of orthopedic diseased cows was reduced by 2.4% ($0/11*10^{12}$/l) compared to healthy cows, haemoglobin contents of diseased cows was reduced by 3.6% (4.8 g/l). Red blood cell index of cows with digital purolo-necrotic disorders was insignificantly reduced compared to healthy cows.

White blood cell count of healthy animals was certainly reduced by 22.4% ($2.44*10^9$/l) compared to diseased cows.

After biomedical measurement of blood it was determined that total protein amount of diseased cows was reduced by 6.4 % (5.63 g/l) compared to healthy cattle. Total protein reduction occurred in the setting of alpha globulin fraction reduction of 2.8%, gamma globulin fraction reduction of 15.8%, with insignificant increase of beta-globulin fraction of 2.7% compared to healthy cattle.

According to our research the claw disease incidence of black pied and Simmental cattle was high and accounted for about 67.7…74.1%. Ulcers and purulent pododermatitis were prevalent among the purolo-necrotic disorders. It should be noted that skin ulcers of interdigital cleft wall were prevalent among the black pied cattle, and subunguis ulcers appeared more often by Simmental cattle.

Leading causes of purolo-necrotic disorders of limbs distal part in black pied and Simmental cattle on researched farms are faulty management technology, faulty feeding, non-observance of sanitation and hygiene standards, absence of regular preventive cleaning and trimming of cattle claws.

Generalizing the results from longstanding researches of foreign and domestic authors and our experience following measures against disorders of cattle's limbs distal part can be recommended:

1. Regular claw management: inspection, cleaning and trimming of overgrown horn. On farms with diseased cattle claws must be managed quarterly, with the improvement of conditions claws must be preventively cleaned and trimmed every 6 months;

2. Organization of cow's daily constitutional walks on routes provided in advance;

3. Ensuring of cattle's proper feeding in accordance with its performance, and also regular feeding monitoring and adjustment based on results of laboratory evaluation of feeds, blood, milk, urine, ground;

4. Observation of sanitation and hygiene standards for livestock buildings and their regular sanitation;

5. Organization of disinfecting footbaths and obligatory disinfection of claws by cattle zero grazing system;

6. Organization of reliable system for manure disposal which prevents hooves from being held in liquid manure, of forehanded bedding changing, orts removal from livestock buildings, and changing of old floors.

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