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CONTENTS

EFFECTIVENESS OF REMOTE MONITORING SYSTEMS AND DAIRY COW WELFARE

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Abstract

Nowadays, dairy cows rearing systems have modern technologies that support breeders by improving the management of animal rearing, an important factor in their welfare. This study aimed to determine whether remote monitoring systems are effective in dairy cow welfare.

In this study, 208 dairy cows, of which 130 were monitored remotely (CM) and 78 were observed directly visually (CO). The daily activities of the animals were studied, associated with feeding behaviour, rumination behaviour, and rest behaviour.

The results demonstrated the effectiveness of the monitoring system on the dairy cow welfare by rapid identification of diseases associated with animal behaviours. At the same time, this brought a plus to the animal rearing management by diagnosing and immediate applying the treatment to animals identified with disease.

Keywords: *dairy cow, monitoring system, welfare*

Introduction

The dairy cows immediately after calving can experience various diseases, with negative effects on their health, welfare, and productivity, which is why the monitoring health is important for their welfare [1,2,8]. The assessment of animal welfare is based on both the resources (inputs) and the results (outputs) obtained from breeding. Resources that including animal husbandry, animal, and human involvement, are factors that are easy to quantify and record, repeatable which can condition welfare efficiency.

The technological developments of the last decades have led today to the existence of many digital applications in the animal husbandry sector, developed to be used inside shelters. Sensor technologies have been implemented in monitoring bio-signals describing relevant behavioural indicators associated with changes in animal welfare, and individual data collection by accelerometer solutions such as monitoring systems based on animals has gained attention.

The number of publications on the application of accelerometer systems for cattle has grown considerably in the last ten years.

Monitoring many dairy cows in a shelter, can be time-consuming and expensive. In addition, the behaviour of the animals - a welfare indicator, cannot be evaluated for example during their immobilization for clinical or paraclinical examination. Understanding certain behaviours require knowledge of the disease and along with animal responses to the disease and behavioural studies, contribute to the understanding of the disease fighting systems [7]. We know that animal health is an important welfare indicator, and that any pathology leads to poor welfare. So, sensor-based continuous monitoring systems can complement animal health monitoring, while providing additional information used to improve dairy cow management. This would allow farmers to identify cows at high risk of disease which would then benefit from individual monitoring [1,2,3,4,8].

Material and method

The research was conducted for six months (February to July) on a farm of dairy cows raised in a semi-intensive system. The farm (n: 208) had two shelters with a roof in two bays, a shed for uniform natural lighting and semi-open longitudinal walls made of tarpaulin. The shelters consisted of one compartment each, with a resting area (cubicles tip) for cows in three rows, with a circulation lane shared with the feeding area, where the feed was offered with the help of technological machines, and the watering and movement area was shared with the collecting and evacuating manure one. The resting area had a continuous concrete floor on its entire surface and used a rubber carpet and a thin layer of straw as bedding material. The accommodation area provided 2.2 m^2/cow. The delimitation of the cubicles consisted of round metal bars with a frontal bar and a bar at the withers. The feeding area is provided with a feeding front and collective drinkers for watering located in the movement areas of the cows.

Animals

The animals were not taken out of the production cycle, monitoring and direct visual observation being done in their shelter. Dairy cows from the Holstein Friza breed (n: 208) aged between 14 months and seven years were monitored, which we grouped according to the presence or absence of the remote monitoring system in: cows monitored (CM, n: 130) and cows followed by direct visual observation (CO, n:78). All the animals taken in the study were housed in the same conditions and were fed with the same type of feed depending on their physiological state. The cows were milked three times a day.

The monitoring way

The monitoring system used, was SmartBow remote monitoring system (GmbH, Weibern, Austria) which detect the rumination time, the movement of dairy cows and the estrus, having an algorithm for their interpretation as behavioural manifestations. The system has a SmartBow sensor fixed in the right ear, with dimensions of 52 x 36 x 17 mm and a weight of 34 g. The acceleration data of the animal's head, and/or ear movements are recorded with a frequency of 1 Hz by the sensor and then sent to the SmartBow receivers installed all along the length of the shelter. The receivers are connected to the SmartBow server which processes the data using specific automatic learning algorithms, which are subsequently viewed on a PC and a phone. When changes in activities and implicitly in behaviour exceed a defined threshold, an alert is generated. SmartBow uses its artificial intelligence system - IntelLigence Animal Recognition (APRIL) - which learns the individual behaviours of animals and adapts to their activity patterns. The SmartBow sensor continuously monitors the location, activity, rumination, and health of dairy cows in real-time. The individual information is collected and transmitted in a few seconds to the internal receivers. Each cow data is analysed by the SmartBow artificial intelligence system, transmitted, and processed immediately. The software is automatically updated on the server so that the sensors never "get old". [8,11]

Real-time alerts are generated when changes occur in rumination and activity/behaviour patterns, then are sent to the computer, and on the digital map of the shelter shows the current position of each cow. SmartBow is a dairy cow monitoring system that constantly provides data regarding each animal with three major functions: it monitors rumination with an accuracy of up to 99%, identifying health problems faster. The cow ear moves continuously when it ruminates, and the pattern is detected by the acceleration sensor. The system can generate two different alerts that provide indications of a possible health problem: either an immediate decrease or a slow decrease in rumination (for a few hours or in the long term - several days). Since each animal has a different way of rumination, it serves as its own reference. This model depends on factors such as age, lactation stage and feed composition. For dairy cows, each alert generated will be individual, thus assuring a high level of precision. The system detects heat in cows with 97% accuracy, saving time and increasing the success of artificial insemination. And finally, the system tracks and detects the location of the cows on live 24h/7 days, saving time and labour to track them. Each ear-level sensor, sends a signal and measures the time required to reach the receivers, allowing them to identify the exact position of the cow and display it on the digital map on the shelter PC [11,12].

The basic behaviours of the studied animals were evaluated by direct visual observation, in two visits per month, for 30-50 minutes, in the morning, at noon and in the afternoon.

The feeding behaviour (table 1), was recorded when the cow had its muzzle close to the feed, grabbing it, and then chewing it (head position being up or down).

Table 1

The basic behaviours of the studied animals

Behavior	Manifestation	Description
Feeding	prehension	the cow had its muzzle close to the feed, grabbing it, and then chewing it (head position being up or down)
	rumination	the cow regurgitated the food bowl, chewing it by moving its head and jaw in a circular motion, and then swallowing it chewed
Other	socializing, moving	manifestations that did not involve feeding behavior

Rumination was recorded when the cow regurgitated the food bowl, chewing it by moving its head and jaw in a circular motion, and then swallowing it chewed. Other behavioural manifestations monitored were locomotion, monitored and recorded in the same time intervals, when the animals moved on the movement surface or sat in a quadrupedal position, and sleep, when the cow in the resting area had its eyes closed, ears let down, neck relaxed. The obtained data were used to compare them with the system records.

Statistical analysis

To be able to compare the activity of the two lot, the obtained data were processed statistically using the t-test, and to establish the algorithm of the two behaviours (rumination and movement/rest), Microsoft Office Excel 2007 (Microsoft Inc, USA) was used, to see if there existed any differences between the two ways of animal monitoring.

Results and discussion

The data obtained after monitoring the basic behaviours of the animals in the two lots (figure 1), showed that the time spent by the cows for rumination, socialization, and movement was slightly higher in lot CM compared to lot CO. In group CM, the system recorded a higher percentage

of rumination and resting behaviour (84,6 %), compared to group CO (80,0%). This was due to the fact that direct observation was carried out by us only at certain times of the day, and the number of animals was much smaller.

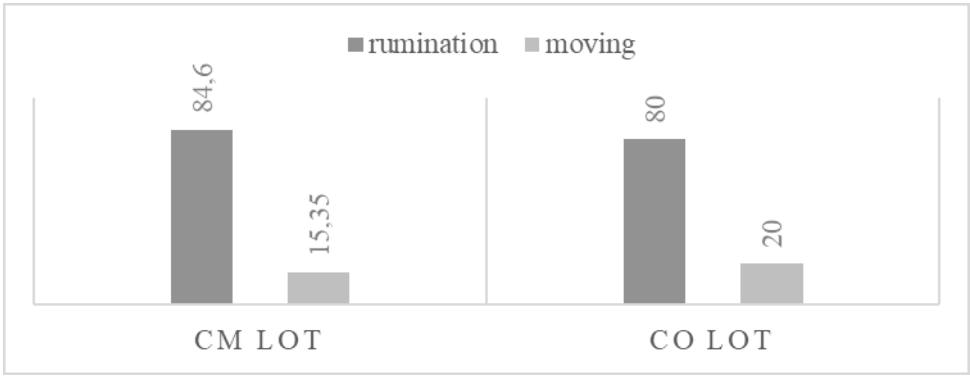

Figure 1. ***The percentage of the two dairy cow behaviours studied***

As can be seen (figure 2), in the same time interval all animals were monitored, the system continuously recording these manifestations of the dairy cows throughout the day, compared to the direct visual observation.

The results of some studies that used the same system highlighted the effectiveness of the Smartbow in terms of rumination time, the number of chewing cycles, as well as the number of rumination alerts [3,4,8]. Other studies presented results of rumination time recorded with this system but did not investigate the agreement regarding chewing cycles or rumination alerts, which are also important in determining the time the animals stay in the lying down position [4,5,6].

Similar results in our study, were recorded also in the case of duration lying down position and standing position in 24h, for the two lots (figure 2).

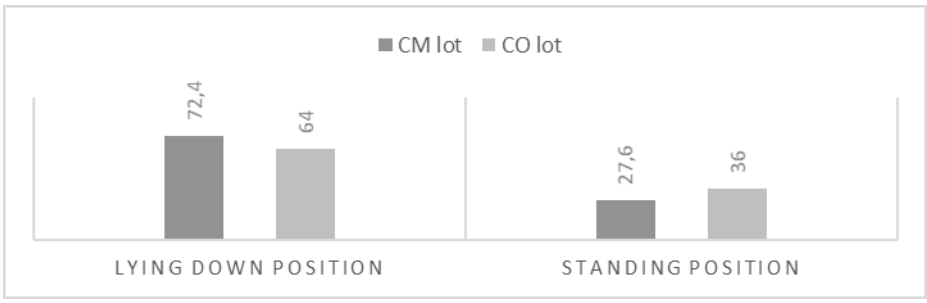

Figure 2. ***The duration (%) of lying down position and standing position / 24h in the two lots***

Starting from the fact that feeding and rumination are essential activities in the life of dairy cows, observing these basic behaviours can provide us with useful information regarding the health of the animals. A certain level of rumination is a condition for ensuring welfare, and the existence of various diseases, fear and stress can inhibit rumination thus affecting the animal welfare. These behaviours should be monitored in sick cows, during and after treatment application [4,8].

Noticing the feeding and rumination behaviour of individual animals is difficult in animal herds, especially if information is sought regarding the duration of these behaviours or the number of cycles of chewing the food bowl, for example. The time spent in the resting position is an indicator of the dairy cow welfare, which can help the farmer to identify cows easier with leg problems, and more. Other research results have reported that the time and activity of rumination behaviour can be correlated with clinical and subclinical disorders of dairy cows, and these parameters can be measured with the help of accelerometers [1,3,4,11].

Other results obtained showed a high percentage of lameness in dairy cows (figure 3), being 64% in CO lot compare with 36% in CM lot. Monitoring with SmartBow allows the farmer to observe these behaviours, being able to immediately request the intervention of the veterinarian before the respective diseases worsen.

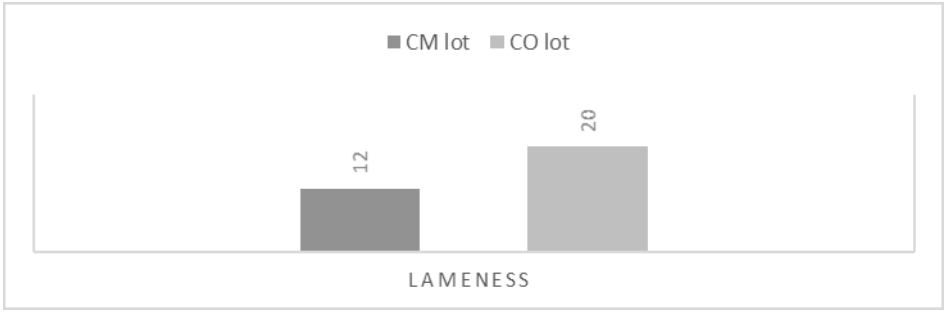

Figure 3. ***The percentage of lameness in the dairy cows observed in the two lots***

The system, identify the location of the animal in the shelter at any time, issue alerts based on which the veterinarian can intervene in the diagnosis and immediate application of the treatment. Thus, the animals can be recovered quickly and with low production losses for the farmer.

Comparing these results, one can say that the monitoring system is effective for detecting diseases of lactating cows housed in shelters, by monitoring the time of digestive and resting behaviour. Lesions that cause lameness cause considerable pain to affected dairy cows, so they experience

reduced welfare, they become submissive, body conformation decreases, fertility decreases, and the incidence of metabolic diseases increases [9,10].

Conclusions

Through direct visual observation, the feeding and rumination behaviour of dairy cows – welfare indicators, cannot be monitored in all animals and, moreover, the evaluation cannot be carried out continuously throughout the day, subjecting the farmer to additional costs and economic losses. Monitoring with SmartBow can bring an increase the animal welfare and the farmer, through the early detection of diseases, even before the onset of clinical signs, as we saw in the case of laminitis. Animal monitoring using modern remote systems provides an objective opinion on the health, welfare, and productivity of the entire herd of animals.

References

1. M. Alsaaod, J.J. Niederhauser, G. Beer, N. Zehner, G. Schuepbach-Regula, A. Steiner, Development and validation of a novel pedometer algorithm to quantify extended characteristics of the locomotor behavior of dairy cows. J. Dairy Sci., 98 (2015), pp. 6236-6242, 10.3168/jds.2015-9657
2. M. Alsaaod, S. Huber, G. Beer, P. Kohler, G. Schupbach-Regula, A. Steiner, Locomotion characteristics of dairy cows walking on pasture and the effect of artificial flooring systems on locomotion comfort. J. Dairy Sci., 100 (2017), pp. 8330-8337, 10.3168/jds.2017-12760
3. Z.E. Barker, J.A. Vazquez Diosdado, E.A. Codling, N.J. Bell, H.R. Hodges, D.P. Croft, J.R. Amory. Use of novel sensors combining local positioning and acceleration to measure feeding behavior differences associated with lameness in dairy cattle. J. Dairy Sci. (2018), 10.3168/jds.2016-12172
4. S. Benaissa, F.A.M. Tuyttens, D. Plets, T. de Pessemier, J. Trogh, E. Tanghe, L. Martens, L. Vandaele, A. Van Nuffel, W. Joseph, B. Sonck, On the use of on-cow accelerometers for the classification of behaviours in dairy barns. Res. Vet. Sci. (2017), 10.1016/j.rvsc.2017.10.005
5. J.M. Bewley, R.E. Boyce, J. Hockin, L. Munksgaard, S.D. Eicher, M.E. Einstein, M.M. Schutz, Influence of milk yield, stage of lactation, and body condition on dairy cattle lying behaviour measured using an automated activity monitoring sensorJ. Dairy Res., 77 (2010), pp. 1-6, 10.1017/S0022029909990227
6. M.R. Borchers, Y.M. Chang, I.C. Tsai, B.A. Wadsworth, J.M. Bewley, A validation of technologies monitoring dairy cow feeding, ruminating, and lying behaviors. J. Dairy Sci., 99 (2016), pp. 7458-7466, 10.3168/jds.2015-10843
7. D.M. Broom, Behaviour and welfare in relation to pathology. Appl. Anim. Behav. Sci., 97 (2006), pp. 73-83, 10.1016/j.applanim.2005.11.019
8. Jose M. Chapaac, Kristina Maschatbc, Michael Iwersena, Johannes Baumgartnerb, Marc Drillicha, Accelerometer systems as tools for health and welfare assessment in cattle and pigs – A review Behavioural Processes, Volume 181, December 2020, Doi.org/10.1016/j.beproc.2020.104262

9. EFSA, 2009d. Scientific Opinion on the impact of housing, nutrition and feeding, management and genetic selection on udder problems in dairy cows. Scientific Opinion of the Panel on Animal Health and Animal Welfare. The EFSA Journal (2009) 1142, 1-60.
10. EFSA, 2009f. Scientific Opinion on the impact of housing, nutrition and feeding, management and genetic selection on behavioural problems in dairy cows. Scientific Opinion of the Panel on Animal Health and Animal Welfare. The EFSA Journal (2009) 1139, 1-66
11. V. Schweinzer, L. Lidauer, A. Berger, F. Kickinger, M. Öhlschuster, W. Auer, M. Drillich, M. Iwersen, (2018), Evaluation of the ear-tag sensor system SMARTBOW for detecting estrus events in indoor housed dairy cows. In Proceedings of the 14th International Conference on Precision Agriculture (unpaginated, online). Monticello, IL: International Society of Precision Agriculture.
12. *** https://www.smartbow.com/en/home.aspx

FOOD SAFETY IN POULTRY SLAUGHTERING

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Abstract

In this paper we highlight the importance of applying the quality assurance system using critical control points in poultry slaughtering.

Microbiological, physical, or chemical risks are kept under control or even eliminated in different processing stages.

Breeding and slaughtering birds is an important pillar in the food industry due to the biological and nutritional qualities of the finished products.

Poultry meat is a basic food in the nutrition of the population regardless of the social category. Food producers are obliged to comply with the food safety procedure at international standards quality and financial point of view.

The results demonstrated the effectiveness of the monitoring system on the poultry slaughtering. At the same time, corrective measurements can be applied if it is necessary if risks associated are identified.

Keywords: *poultry slaughtering, monitoring system, risks*

Introduction

The quality of meat and meat products depends on many factors, for example conditioned by the quality of live birds arriving at the slaughterhouse.

In the industrialized poultry farming branch, efforts are being made to ensure an increased quality of meat and meat products both from the point of view of the commercial aspect and its nutritional properties. The technological flow of poultry slaughtering has experienced spectacular improvements over the years, being almost entirely automated, in addition to the economic and sanitary-veterinary advantages, automation has some drawbacks like the non-uniformity of the birds entering the slaughter stream creates some problems in the evisceration area, increasing the risk of bacterial contamination.

The fundamental principles of hygiene and operation of factories in the meat industry were taken into consideration, namely: the flow for each category of activities or products is a logical sequence of operations, in one direction, from reception to shipment; the sequence of operations and technological phases are organized in space and time so that there is a circuit of inputs and outputs from the process as short as possible by reducing distances or transports and reducing manipulations; the annex

spaces and social areas are organized in such a way as to allow the staff an easy, direct access to the serviced area and to carry out their activity in a hygienic manner.

The main risk categories take into study are microbiological, physical, and chemical hazards.

Microbiological hazards

The spoilage microflora multiplies very quickly at a low temperature compared to the pathogenic microflora that multiplies at an elevated temperature. Meat kept at a refrigerated temperature shows signs of spoilage before the number of pathogenic germs is harmful to the consumer, but the lack of organoleptic changes does not indicate that it is not harmful. In the poultry slaughtering units, contamination of the carcasses with pathogenic germs can occur during the scalding, plucking, evisceration stages, but also during the meat handling stage by the slaughterhouse staff during the cooling and delivery phases when good hygiene practices are not respected (GHP) and working (GMP). Meat is an important source of germs from the genus Salmonella, Escherichia, Clostridium, Campylobacter jejuni, Listerya Monocytogenes, but also several pathogenic germs from the category Staphylococcus Aureus, Bacillus Cereus, Vibrio and Aeromonas. Pathogens are mostly found in the gastrointestinal flora and some of them on bird plumage, skin, and machinery. Antemortem veterinary health examination cannot guarantee that birds brought to slaughter are free of pathogenic germs, therefore hygienic practices before slaughter are necessary, i.e. foot disinfection before stunning.

The degree of hygiene and the measures applied to the slaughter of birds can be appreciated by the microbial load (NTG) of the carcasses at the end of the slaughter line. NTG usually has values between 1000 and 10000/cm2 of casing surface but applying additional hygiene measures can reach 100-1000/cm^2.

Chemical hazards

The chemical risk is represented by residues of substances used in agriculture and animal husbandry, among which we list pesticides, fertilizers, antibiotics, hormones, but also substances used to wash and disinfect facilities, manufacturing, and storage spaces.

Physical hazards

Physical risks are represented by the technological operations used in the slaughterhouse.

Material and Method

The European Union has a comprehensive legislative framework in place governing the use of The research was conducted for one year period

following the monitoring critical point control system validated by the self-control plan based on laboratory tests.

The establishment of critical control points is based on the analysis and identification of risks, the critical control points and critical limits are established for slaughtering operations where thermal treatments are not applied, temperatures, visible defects, the concentration of washing and disinfection solutions are established.

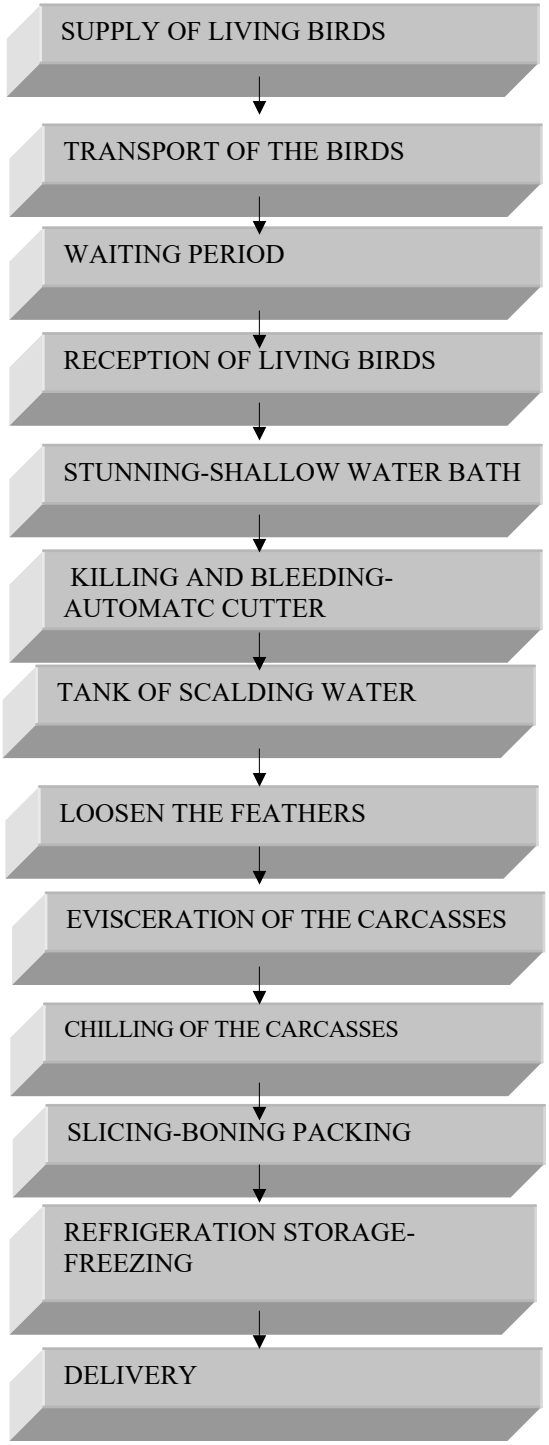
Keeping under control this risk of good practices, of animal husbandry, of disease identification, requires the implementation and improvement of some measures to eliminate Salmonella bacteria from animal feed.

The stress of transport can lead to the reactivation of latent Salmonella infections, and some birds can become ill from improperly sanitized transport vehicles.

Chemical substances used pesticides, antibiotics, hormones used both in agriculture and in zootechnical farms, by animal breeders must be kept under rigorous control because their accumulation in the finished products can be found. Chemical risks are best controlled by educating the personnel involved in the animal husbandry sector but also in agriculture, by carrying out periodic tests.

Rigorous monitoring of cleaning and disinfection operations of transport vehicles, cutting tools, machines, and work surfaces. Sanitation programs must be as precise as possible, with details on water temperature, water flow rate, concentration and type of chemicals used, description of procedures and their frequency. Monitoring can be done through visual inspections at certain time intervals backed up by laboratory tests.

Cutting operations are difficult to monitor, one way is to train and train a trained and specialized team including trenching workers to know in detail all the procedures to be applied and those imposed. The cleaning methods must be precisely specified and continuously monitored, and in the case of automatic systems, the water temperature and pressure will be monitored. The cooling of the cases can be easily monitored by continuously measuring the water and air in the refrigerated space.



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3 PCC

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Figure 1 . ***Flow chart for poultry shloutering***

Table 1

Finished products self-control program

Food category	Micro-organism	Sampling plan		Limits	Reference laboratory analytical method	Stage to which the criterion applies	Sampling frequency	Interpretation of test results	Action based on results
		N	c						
Bird carcass	Salmonella	50	7	Absence in 25 g	EN/ISO 6579	Carcass after refrigeration	1 case sample consisting of 5 cases / week, i.e. every day of the week to be checked from different lots.	— satisfactory, if the presence of Salmonella is detected in a maximum number of c/n samples; — unsatisfactory, if the presence of Salmonella is detected in a number of samples greater than c/n. After each sampling session, the results of the last ten sampling sessions are evaluated to obtain the number of samples n.	Improving slaughterhouse hygiene and reviewing procedural controls, animal origin and biosecurity measures in holdings of origin
Bird carcass - neck skin sample	Salmonella	50	7	Absence in 25 g	EN/ISO 6579	Carcass after refrigeration	1 sampling every 10 days of production (15 refrigerated carcasses – 10 grams of neck skin / each carcass)	— satisfactory, if the presence of Salmonella is detected in a maximum number of c/n samples; — unsatisfactory, if the presence of Salmonella is detected in a number of samples greater than c/n. After each sampling session, the results of the last ten sampling sessions are evaluated to obtain the number of samples n.	Improving slaughterhouse hygiene and reviewing procedural controls, animal origin and biosecurity measures in holdings of origin

Table 2

Recording register of the surface sanitation laboratory tests

Sampling location	No. sampling process	Lab	No. of the test	Results C / NC	Nonconform result		Determined values			
					Correction	Corrective measurements	NTG	B. coli form	Listeria	Staphylococcus
plucking section	3	DSVSA DB	20053	C			<1 ufc/g	absent / 10 cm²		
Evisceration section	13	DSVSA DB	20150	C			<1 ufc/g	absent / 10 cm²		
slicing section	15	DSVSA DB	20214	C			<1 ufc/g	absent / 10 cm²		
working tables organs section	26	DSVSA DB	20299	C			<1 ufc/g	absent / 10 cm²		
prepared working tables	38	DSVSA DB	20398	C			<1 ufc/g	absent / 10 cm²		
Slicing knives	42	DSVSA DB	20462	C			<1 ufc/g	absent / 10 cm²		
shuttles	56	DSVSA DB	20698	C			<1 ufc/g	absent / 10 cm²		
frozen products ware house	58	DSVSA DB	20749	C			<1 ufc/g	absent / 10 cm²		
Transracial cymbals	71	DSVSA DB	20926	C			<1 ufc/g	absent / 10 cm²		
Evisceration, slicing section	94	DSVSA DB	21346	C			<1 ufc/g	absent / 10 cm²		
Evisceration, organs, slicing section	97	DSVSA DB	21397	C			<1 ufc/g	absent / 10 cm²		
slicing section floor	100	DSVSA DB	21477	C					Absent	
Evisceration, organs, slicing section	101	DSVSA DB	21498	C			<1 ufc/g	absent / 10 cm²		
red protective equipment	144	DSVSA DB	22091	C			<1 ufc/g	absent / 10 cm131		
chain gloves	148	DSVSA DB	22152	C			<1 ufc/g	absent / 10 cm131		
car finished	212	DSVSA DB	22765				<1 ufc/g	absent / 10 cm131		

product				C						
working tables slicing	222	DSVS A DB	22911	C			<1 ufc/g	absent / 10 cm131		
car and live bird cages	226	DSVS A DB	13549	C						negative

Results and discussion

The testes take into considerations were conformed with the legislation applicable.

The highest number represents evisceration, organs, slicing section follow by transracial cymbals and frozen products warehouse as it is represented in Figure 2.

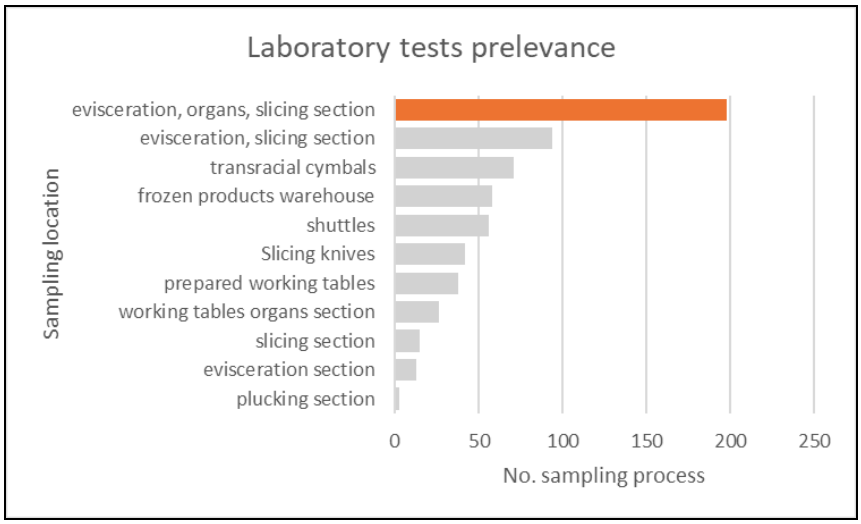

Figure 2. ***Laboratory tests prevalence***

Conclusions

The study carried out in the poultry slaughtering unit highlights the HACCP system by applying it according to the laws in force.

Following the flow chart and the laboratory tests was demonstrated that the quality safety system highlights several critical control points.

On the technological flow of slaughtering birds, the most difficult surfaces to sanitize are the floors of the bleeding and plucking sectors.

The use of very effective decontaminating substances, but in appropriate concentrations, the main cause of incorrect decontamination is mechanical cleaning and poor washing.

Recommendations

Monitoring the state of health and hygiene of the birds that come to the slaughterhouse by implementing the concept "from farm to fork", correct maintenance, prevention of diseases by means of specific general prophylaxis with the guarantee of obtaining quality meat.

Slaughterhouse veterinarians must inform the veterinary health staff on the farm about any diseases detected following the veterinary health examination in the slaughterhouse.

Permanent supervision of feed sanitation to detect possible contamination with fungi, pesticides, some of them being cumulative in the carcass.

Strict adherence to the food and water diet period before slaughter.

Transporting the birds from the farm to the slaughter unit with healthy, hygienic means and respecting the density in the cages.

During plucking, to reduce bacterial contamination, it is recommended to replace the "rubber fingers" periodically.

To avoid bacterial contamination during the cooling of the carcasses, it is recommended to chlorinate the water within the permissible limit of 20 ppm.

Avoiding the agglomeration of refrigerated finished products in storage, ensure sufficient space between the pallets and the wall for air to circulate.

In the case of finished frozen products, immediate intervention will be taken to regulate the temperature in the refrigerating facilities by lowering the temperature.

References

1. GUIDE BOOK FOR THE PREPARATION OF HACCP PLANS"(1997) - United States Department of Agriculture (USDA), 1997
2. HACCP USER GUIDE" - Food Linked Agro Industrial Research (FLAlR), Concerted Action Nr. 7.
3. Heber, A.J. et al. (2006) 'Poultry Slaughtering Plants: Concentrations of Microbial Aerosols in Poultry Slaughtering and Processing Plants', ASHRAE Transactions, 112(2),pp.644–655. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=22882557&site=ehost-live (Accessed: 26 September 2022).
4. I.V.Opris (2007)-"Poultry products, poultry populations, genetics and avian breeding", Ceres publishing house, 2007
5. Jameel, F.R., Hizlisoy, H. and Cinar, M.U. (2021) 'Investigation of the Effects of Antimicrobials to Control Campylobacter Jejuni in Chicken Carcass', Annals of the Romanian Society for Cell Biology, 25(1), pp. 6590–6607. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=158660664&site=ehost-live (Accessed: 26 September 2022).

A CASE OF PSEUDOHERMAFRODITISM IN DOGS

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Abstract
This paper highlights an extremely rare case of pseudohermaphroditism in a 1-year-old American Bully dog, owned by a Bucharest citizen. It is hoped that this paper will present some morphological features, encountered in the dog with the congenital anomaly mentioned above, features that have not been described in this species or at least not scientifically communicated in recent years around the world.
Keywords: *pseudohermaphroditism, reproductive disorders, dogs.*

Introduction

Pseudohermaphroditism in animals is characterized by testicles usually located in the abdomen and female genital tract. The labia are poorly developed, the vulva is reduced, the clitoris is hypertrophied, the gonads are hypoplastic, without a seminal line, but the Leydig gland is hypertrophied.

These types of hermaphrodites are very masculinized. It is found mainly in pigs, rarely in cattle and horses. In the case of horses accompanied by aggressive behavior.

A case was described in a tomcat in 1997, in a paper at the Faculty of Veterinary Medicine from Oslo, Norway and another case in 2019 presented at the Scientific Communications Session of the SPIRU HARET Faculty of Veterinary Medicine in Bucharest. No reported cases have been found in the dog in the last 20-30 years [1,2,3].

Case Report

An 8-month-old American Bully dog, bicolor (blue and white), owned by a citizen of Bucharest, was presented at the C.M.V.I. Dr. Grigorescu Paul. The owner motivated the visit for an alleged parafimosis and consequently, the injury of the penile mucosa.

After examination of the genital tract, the presence of crusts was found due to damage to the penile mucosa and the presence of an open foreskin on the midline (Fig 1). This actually led to damage to the penile mucosa.

On closer examination, the alleged penis was a hypertrophied clitoris (Fig. 2). Also, the two testicles were normally shaped according to the age and size of the animal, being housed in separate scrotum bags (Fig. 3). The

presence of the vulva, vagina and urinary meatus was found to be retrotesticular (Fig. 4).

The easy diagnosis was male pseudohermaphroditism.

The morphophysiological situation of the dog was presented to the owner and he was proposed in addition to the foreskin plasty and the orchiectomy of the animal. Another proposed surgical option would have involved excision of the foreskin and clitoris, but the intervention would have been more extensive and with a different healing time. Possible post-operative complications were also taken into account.

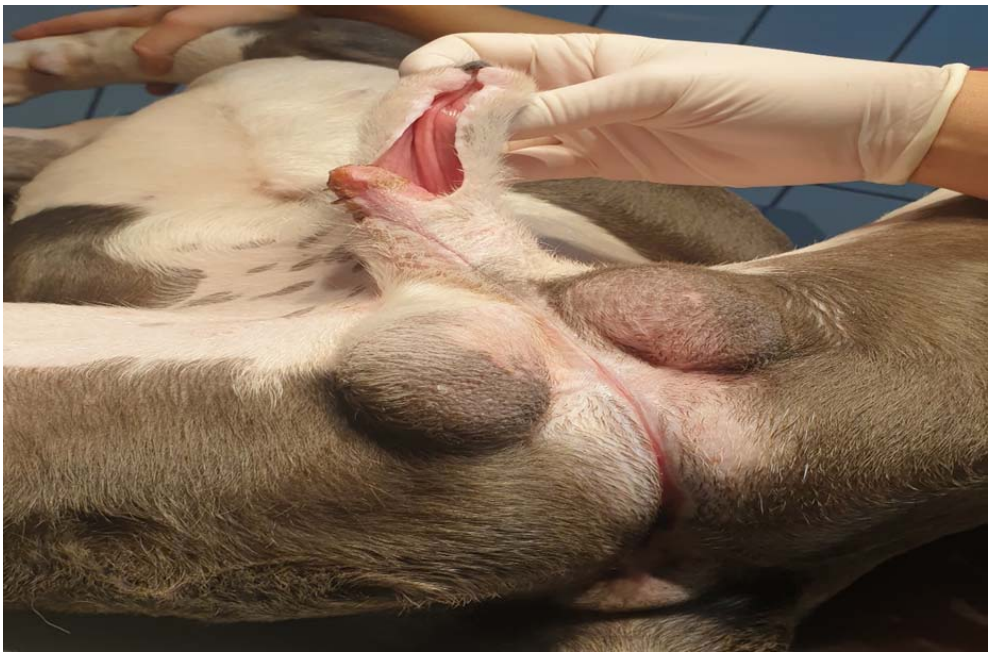

Fig 1. ***General aspect of the open foreskin (orig.)***

The owner refused orchiedectomy because he owned the dog with another person, the second one wanted it intact.

We decided to restore the foreskin cavity, just to be able to house the hypertrophied clitoris (Fig. 5). I have postponed the castration until a possible decision of the two owners appear.

Fig 2. ***Hypertrophic clitoris with mucosal lesions (orig.)***

Fig 3. ***Hypertrophic clitoris with lesions of the mucosa and testicles in its own bursae (orig.)***

Fig 4. ***General appearance of the vulva, vagina and urinary meatus (orig.)***

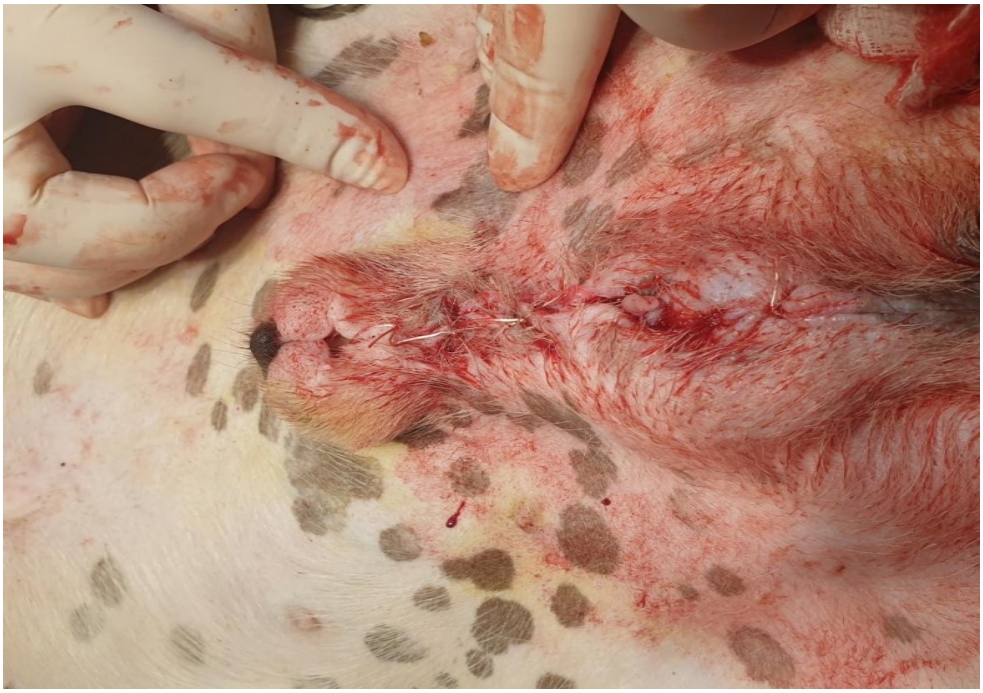

Fig 5. ***Foreskin plasty, post-operative appearance (orig.)***

Discussion

Pseudohermaphroditism in dogs is a congenital malformation, extremely rare.So far, this morbid entity has not been communicated to the dog, on the territory of our country.

The research should have been extended by exploring the genital tract in the abdomino-pelvic cavity. This involves the approval of the owners. The fact that this type of congenital disease is a first in Romanian veterinary medicine, was decided to be presented in a university environment.

References

1. Bârțoiu A., Seiciu Fl. (2006). *Treaty on the pathology of animal reproduction*. Bucharest, Ed. II.
2. Bredal W.P., Thoresen S.I., Kvellestad A., Lindblad K. (1997). *Male pseudohermaphroditism in a cat*, J Small Anim Pract, vol. 38 (1): 21-4.
3. Seiciu Fl., Drugociu Gh., Boitor I., (1978). *Normal and pathological reproduction in domestic animals.* Bucharest, Ed. Ceres.

THE EUROPEAN LOCA. DATA ON RESEARCH CONDUCTED IN APIARIES IN ROMANIA

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Abstract
The European loca is one of the major infectious-contagious diseases of bees with a devastating impact on contaminated apiaries. The disease particularly affects the larval stage of the bee Apis mellifera, as well as other species of the genus Apis. In Romania, the European location causes significant damage to apiaries throughout the country. The research was carried out on samples taken from 20 apiaries, 10 affected by the spot and 10 healthy apiaries, witness.
Keywords*: infectious-contagious diseases of bees, European loca*

The study was conducted over a period of 2 years ACTIVE beekeepers (2019-2021) and included 2 distinct categories of subjects: - healthy bee families belonging to the apiaries of the Research and Development Institute for Apiculture; - families of bees affected by stress, deficiency diseases or different diseases (EUROPEAN PLACE) from private beekeepers' hives;
The research included samples collected from 20 BEES:
10 analyzed samples from clinically healthy beehives (Control batch);
The bee samples were examined by:
- anamnesis – taken from beekeepers
- clinical examination of live bees
- the laboratory examination of bees

The diagnosis of diseases in bees was carried out according to O.I.E. (International Office of Epizootics) [1,2]
The research aimed to:

- Performance
- Examination by direct microscopy
- Bacterioscopic examination [3,4] of the intestine of the adult bee, carrying or not carrying etiological agents of the European locus, but clinically healthy – a method of diagnosing the state of health, which provides objective data for the identification of transient changes before the appearance of clinical signs of the disease [5].

POSITIVE samples from bees intestines	NEGATIVE samples from bees intestines
8 (40,0 %)	12 (60,0 %)

Fig. 1. ***Positive and negative samples from bees intestine***

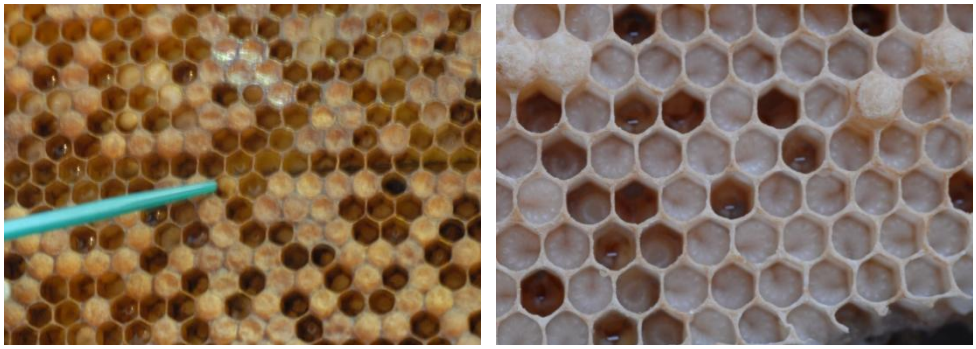

Fig. 2. ***Positive and negative samples for European Loca (original)***

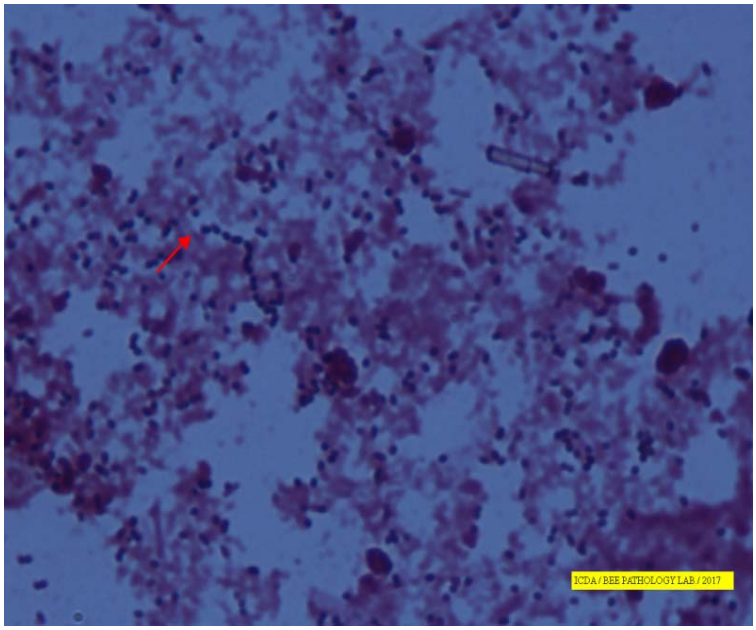

Fig. 3. ***Mellisococcus plutonius (Gram staining, original)***

Conclusions

1.The study was conducted over a period of 2 years active beekeepers and included 2 distinct categories of subjects: families of healthy bees (Control Group) and families of affected bees (Experimental Group) coming from different apiaries of some private beekeepers.

2.The main goal of the research consisted in the development and optimization of an original prophylaxis methodology through the clinical examination of the bee families supplemented by the laboratory examination.

3.The main objective of this work is to complement the classical methodology of clinical examination of bees with the microscopic examination of bee intestines, which would allow establishing the diagnosis for the purpose of monitoring their health.

4.The diagnosis of diseases in bees was made according to European Norms and those of WOAH (World Organization for Animal Health, OIE) by adopting an original method of microscopic diagnosis from the intestine of bees

5.The use of bacterioscopic examination of gut samples of healthy adult bees (carriers/non-carriers of the etiological agents of bacterial diseases) as a method of diagnosing the state of health, can provide objective data, necessary for prophylaxis in the European area.

6.The research included samples collected from bee families belonging to private apiaries with different pathologies as an experimental batch and from clinically healthy apiaries from the Bucharest Beekeeping Research and Development Institute.

7.During the examination by direct microscopy and the bacterioscopic examination of the intestine of the adult carrier bee, but clinically healthy, the presence of the vegetative forms of some etiological agents of major bacterial diseases was found (suspected European locus). We used this new examination methodology, because it can be an effective tool in completing the diagnosis for the prophylaxis of the European loci in the Apis mellifera bee.

8.These studies confirmed the fact that there is a correlation between the morbidity and mortality of bee colonies and the presence of cocci and bacilli in the gut samples of live adult bees.

9.Microscopic examination of bee intestine samples can represent an important prophylactic measure in the management of European locust in bees.

10.The presented method can be performed periodically as a sanitary-veterinary surveillance action in private beehives for the purpose of early detection of the European locust.

References

1. Aronstein, K.A., & Murray, K. D. (2010). *Chalkbrood disease in honey bees.* J Invertebr Pathol.,103 (Suppl 1), S20–S29.
2. Asiminei, S., Solcan, G., Secașiu, V., Mitroiu, M. D., Puchianu, G., Isan, E., Anderco, S., Dobre G. (2016). *Patologia albinei melifere*. Ed. "Ion Ionescu de la Brad", cap. IV, pp. 119-120, Iași, Romania.
3. Castagnino, G. L. B., Mateos, A., Meana, A., Montejo, L., Zamorano Iturralde, L. V., Cutuli De Simón, M. T. (2020). *Etiology, symptoms and prevention of chalkbrood disease: a literature review,* Rev. Bras. Saúde Prod. Anim., Salvador, v.21, 01 - 16.
4. Gilliam, M., Taber S., Bray Rose, J. (1978). *Chalkbrood disease of honey bees Apis mellifera L.: a progress report*. Apidologie, v. 9, 75-89.
5. Heath, L.A.F. (1982). *Development of chalk brood in a honey bee colony; chalkbrood pathogens: a review*. Bee World 63 (3), 119–135.