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MODERN ASPECTS OF MARKING OF ANIMALS**

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**Communication

Abstract: The conventional marking and identification of animals can be done in several different ways. With the application of modern informatics and electronics solutions, it is possible to substitute conventional ways with the different types of the electronic marking and identification. All types of electronic identification for transferring data are using the technology of the radio frequency (RFDI). With application of electronic marking, it is possible to achieve a great number of advantages of which the most important are the high precision of reading the data, individual supervision for every animal, automatic input of data, processing and keeping the information as a permanent actualization of data base. It is necessary to remove all existing defects and in future to work on the improvement of existing types of the electronic marking of animals.

Key words: Electronic marking, RFDI technology, Animal

Introduction

Marking of animals means putting some specific marking tags on some suitable places on the animal body, for easier identification and reliable control of the production, health, fertility and selection of cows themselves. In previous practice marking of animals was realized in different ways: tattoo, ear marks (plastic and metal), stigmatization (hot and cold) etc., until the development of the electronics and informatics introduced the new way of safest and most correct marking of the heads of livestock.

Results and discussion

With further improving and miniaturization of the electronics, a great number of different types of the electronics marking were developed. All developed systems till now have used radio frequency for transfer of data

(RFDI). That is why it was necessary to introduce exactly defined standards in the use of the electronics identification by using of those technologies.

The ISO-standard 11784 defines the technical details and the structure of 64-bit code of transponder for electronic marking, and the ISO standard 11785 defines the technical aspects of communication between the transponder and the measuring instrument which is used for "reading" the number on the animal itself (*Huhter, 1996.*) The ISO standard 11785 defines the use of two different types of the RFDI system in the combination (full duplex FDX and half duplex HDX) on the working frequency of 134.2 kH (*Eradus, 1998; Eradus and Rossing, 1994*).

The practical use of the RFDI technology in the function of marking of animals has a certain number of problems, and the main disturbances are speed and distance of reading. Because of that the ICAR 1995 is bring some demands which are concern the mentioned parameters (*Geers et al., 1997*).

Many researches and realized projects are showing that the use of RFDI technology in the function of marking of animals, a number of advantages can be achieved, many of them relate to the farmer (*Geers et al., 1997*). The usage of the electronic marks and automatic reading is eliminating the defects of the visual – manual identification of the data. The basic advantages are the reducing the costs of working (*Artmann, 1993*), the reducing of the errors in the readings from 6% to 0.1% (*Austin*, *1995: Geers et al., 1997*).

The electronic system of markings has it's wide use in the area of the modern farm management, primary in the automatized feeding and determination of the head meal and determination of the production parameters (*Hurst et al., 1983*). detecting the reproducing parameters and discovering the estrus on time (*Rossing et al., 1983*), the detecting the health condition of the animal by direct way of controlling the body temperature, the activity of movement, hearth work etc. or by indirect way with analyzing the quality of the products (for example the parameters of milk quality) (*Schlunsen et al., 1987; Maatje et al., 1992*). Those advantages are mostly expressed in the free systems of keeping the animals where even under the lower view of every animal individually, with the use of electronic identification it is possible to achieve the individual supervision of every animal and forming the data base for every head separately (*Rossing et al., 1994*).

With the use of the electronics, marking of animals gives us the opportunity for forming the mutual data base on the International level. By this way the change of the information between the states will be very fast and efficient. The success of such project will be under the technical - technological norms, justice roles and models of certification etc., which between must be coordinated and compatible (*Idea, 2005*).

The further advantages of those systems are the improvement of the conditions in the struggle with the contagious diseases and especially in stopping the spreading of the diseases and incidence of the epidemics (*Geers et al., 1997*).

The types of the electronic marking

In the practical use is the large number of types of electronic marking of animals from which are the most frequent the systems of the ear marks, implant, pierce capsule and responders. The research results showed that those types of identification do not influence negatively on the health condition and the production characteristics of the animals (*Caja et al., 2005; Conill et al., 2002*).

The electronic ear marks

Ear marks with the install micro chip and code number which is very resist on the outside conditions and water, and it is constructed to work under the temperature range from -15C till +15C. Every microchip contain the unique code formed with 4 numbers, and it is suitable for using on every farm, because of large number of combination of the original numbers of heads which are marked with them. The research results of the Idea project (2005) is showed that the reading error involved in percent is 0.63%. After 14 months of usage there is tendency for increasing the errors to 2.3%. The putting the ear markings is simple and can be done in the first week of head life. The eventual defects of this kind of marking can be the loosing of the mark as it was the case of the conventional ear marks. The research showed that the lost are higher in the usage of the electronic marks than in the usage of conventional marks (*Caja et al., 2005*).

Bolus

The pierce capsule (bolus) is also used for electronic marking of the ruminant. It is made from the nontoxic ceramic material high density, which is installed in the glass of the capsule transponder which can be different sizes, covered with resin. The size of the bolus makes possible the oral inter-taking into the organism of the young as well as the grown-ups animals (*Caja et a;., 1996*). The errors of readings of this system are 0.35% (the cattle and bison) and remain the constant no matter on the time period *(Idea, 2000*). If the bolus is putted correctly, then there is no possibility of its lost. The successful removing on the line of slaughtering is 100%. The correct reading can be disturbed by the usage of the magnet in the purpose of healing the animals. The application of

the bolus is successfully done at the age of the animal 20 days and further, when the digestive system is enough developed to accept the bolus (*Idea*, *2005*).

Implant (Pelit)

Beside of the mentioned type of the marking, there are the microchips which can be injected under the skin of the cattle. The "pelit" is approved by the USDA (The ministry of agriculture of USA) and can be read manually and automatically, which make possible the different usage. "Pelit" is the microchip which is situated into the protected capsule long 19 and diameter 1.5 mm. Usually it is apply under the skin, in the base of the left ear, or under the skin of the lower part of the left leg. The mentioned capsule contains the code of the 12 figures, which can be read manually or by stationary scanner (*Plavsic and co. 1996*). The errors of reading by using this system are from 0.3% till 0.7% (*Idea, 2005*). The successful usage of this system can be limited by the possibility of complete removing of the transporter on the line of slaughtering. According to the results of the project Idea, the successful remove percent was 80% and the reading was 52%. The results indicate that the risk is increasing the contamination of the life groceries.

Responder

Responder is situated in the lower part of the neck, which also has the plastic marks with the number of the head, and can be the same code like the responder but it is not necessary. In that case, the worker on the farm has to write the separate evidence about the connection between the number on the responder and the number on the plastic marks on the collar. This kind of marking demands a special reader of the responder (cameras), which are situated on the automatic feeders (photo no.4), and also on the entrance in the milking place. At the beginning of every milking line there are metal doors through which the cow is passing by, and than it can be identify. After milking, the complete data about every cow automatically were transferred to the computer which according to the daily quantity of the produced milk, is making the dosage of the concentrate quantity based on the feeding needs.

Conclusion

At this moment, the technical-technological level of development of the system for electronic marking of animals, provides its successful practical use. The basic advantages of the electronic way of marking is the high precise readings of data, automatic entering, processing and saving the information, as

well as the permanent actualization of the data base. By this way, we are improving the productivity of the production on the farm, because the management of the process of production and its control becomes more efficient, faster and easier and it provides the individual view of each animal.

Electronic marking of the animal can be handled on the different ways and different types. The electronic systems for marking can have some defects. During the productivity life of the head, some sort of markings has higher possibilities of losing of the micro chip. In such case, it is necessary to make combination of marking with two types of identification which will result with increasing of the total costs. The defects of some systems means the possibilities of the (physical) contamination of the food, caused with unsuccessful removing of the transponder during the slaughtering process. The usage of some kind of transponder can be influenced by the old age of the animal and morphological level of development of digestive system, and because of that the marking of some kind of animals can be successfully done only after 20 days of oldness. As defect can be considered also that some types of the electronic marks are not visible.

To successfully introduce the electronic marking of the animals and done it practically, it is necessary to remove all existing defects and in the future to work on their improvement.

SAVREMENI ASPEKTI OBELEŽAVANJA ŽIVOTINJA

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Rezime

Konvencionalno obeležavanje i identifikacija životinja se obavlja na različite načine. Aplikacijom savremenih informatičkih i elektronskih rešenja moguće je konvencionalne načine zameniti različitim tiplovima elektronskog obeležavanja i identifikacije. Svi tipovi elektronske identifikacije za prenos podataka koriste tehnologiju radio frekvencija (RFDI). Primenom elektronskog obeležavanja je moguće ostvariti veliki broj prednosti od kojih se najvažnije odnose na visoku preciznost očitavanja podataka, individualni nadzor za svaku životinju, automatsko unošenje, obrada i čuvanje informacija kao i permanentno aktueliziranje baze podataka. Neophodno je otkloniti sve postojeće nedostatke i dalje raditi na usavršavanju postojećih tipova elektronskog obelećavanja životinja.

Ključne reči: Elektronsko beležavanje, Rfdi tehnologija, životinja

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