

RESEARCH ARTICLE

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Antibiotic residues in milk, by using chemotherapy for mastitis in dairy cows and the chalanges for using therapy with natural products in the future

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Abstract

Antibiotic residues in milk nowadays are a major issue. In addition to the economic losses they affect people's health for causing allergies, antibiotic resistance, cancer and other problems[1]. For this reason many countries do constant monitoring to control of antibiotic residues in milk and set maximum residue limit "MRL" thus ensuring food security of counsumers [2,3]. For the determination of residues of antibiotic in milk used qualitative and quantitative methods. Quantitative methods are needed to use the kits as rapid methods which are semi quantitative methods but give us the possibility of a quick intervention to distinguish which products are cantaminated. It may be extended further quantitative ELISA, HPLC, LC/MS, or other methods [5,6]. In our work we used the rapid kits to asses the contamination of milk with residues of antibiotic. Samples were taken in a private milk collector in the area of 'Myzeqea' in Albania. Farms of which was milk, were small family farms. According to a traceability system "positive feedback", we found farms that had residues of antibiotic in milk. This observation proves that antibiotic residues in milk are a real concern and that should be taken into consideration. Antibiotic residues in milk can be avoided by applying the correct treatment protocols of chemotherapy, but a chalange for the future is to find and use the natural products for the therapy of mastitis in dairy cows, which are not created residues in milk.

Keywords: Antibiotic, residues, MRL, milk, rapid kit, natural products.

1. Introduction

In veterinary medicine antibiotic are used for therapeutic purposes, prophylaxis and for improving the growth of animals (6). Consequently, if the withdrawal time is not respected, or if the antibiotic are not used as the protocol say, we may have residues of antibiotic in the food that originate from these animals and used for human consumption such as meat, milk or eggs. Antibiotic residues in milk is a major issue nowadays. In addition to the economic losses they affect people's health by causing allergies, antibiotic resistance, cancer and other problems(1). For this reason many countries do constant monitoring to control antibiotic residues in milk and set maximum residue limit "MRL" thus ensuring food security for counsumers (2,3). For the determination of residues of antibiotics in milk, qualitative and quantitative methods are used. Using the rapid test kits as a fast method gives us the possibility of a quick intervention to distinguish which products are contaminated. Furthermore quantitative methods like ELISA, HPLC, LC/MS, give us the final results (2,3). The purpose of this study is the possibilities of monitoring, detection and prevention of antibiotic residues in milk to ensure consumer food safety, and the challenge of the future for finding and using natural products for the prevention and treatment of mastitis which does not create residues in milk.

2. Material and Methods

In our work we used the rapid test kits to asses the contamination of milk with residues of antibiotics. Samples were taken in a private milk collector in the area of 'Myzeqea' in Albania. The milk came from small family farms. According to a traceability system of "positive feedback", we found farms that had residues of antibiotics in milk. We took five samples of milk, in 5 (tankers with a capacity of 200 litres) in a private milk collector in the

area of “Myzeqea” in Albania. After obtaining the results of the first samples, we took five samples, from five farms whose milk came out positive. After obtaining the results, we took ten samples from the farm, whose milk came out positive against one of the groups that we have taken in the study.

3. Results and Discussion

The analyzes of samples taken at the private milk collector, it found out that one of the tankers had residues of antibiotic in milk.

Table nr 1. Results of analyzes of samples taken in tankers where milk was collected.

Sample nr	Date when samples were taken	Date of analyzes	Results
1	04.03.2015	04.03.2015	+
2	04.03.2015	04.03.2015	-
3	04.03.2015	04.03.2015	-
4	04.03.2015	04.03.2015	-
5	04.03.2015	04.03.2015	-

We continued further tracing taking samples from farms, whose milk was in the tanker which come out positive. Results are presented in table 2.

Table nr 2. Results of analyzes of samples taken from the farms, whose milk was in the tanker which come out positive.

Farm nr	Date when samples were taken	Date of analyzes	Results
1	05.03.2015	05.03.2015	-
2	05.03.2015	05.03.2015	-
3	05.03.2015	05.03.2015	+
4	05.03.2015	05.03.2015	-
5	05.03.2015	05.03.2015	-

The analyzes performed showed us only one farm which had residues of antibiotics in milk. We went to the farm and took a sample for each cow farm. Results have shown in Table 3.

Table nr 3. Results of analyzes of samples taken from farm which turned out positive.

Animal nr	Date when samples were taken	Date of analyzes	Result
1	06.03.2015	06.03.2015	-
2	06.03.2015	06.03.2015	-
3	06.03.2015	06.03.2015	+
4	06.03.2015	06.03.2015	-
5	06.03.2015	06.03.2015	-
6	06.03.2015	06.03.2015	+
7	06.03.2015	06.03.2015	-
8	06.03.2015	06.03.2015	-
9	06.03.2015	06.03.2015	-
10	06.03.2015	06.03.2015	-

The analyses found out two positive cases with antibiotic residues of quinolone. We come back at the farm and the conversation with the farmer and clinical control, showed that two cows which are on lactating period, respectively in second and third month, were treated 4 days with antibiotic- containing enrofloxacin. Use of the antibiotic was ongoing for the treatment of mastitis in cows where we have taken samples nr 3 and nr 6-th. The milk which comes from cows which are treated for mastitis should not be given for public consumption to 4 days after completion of therapy with enrofloxacin, according to some generic drugs manufacturing companies (9,10). But according to other authors, enrofloxacin should not be used in dairy cows (7), for the absence of accurate studies for the quantity of antibiotic residues in milk. In Albania enrofloxacin antibiotic it is widely used for therapy of mastitis but also respiratory or urinary problems in animals, making the possibility of contamination for products originating from these animals and that can be consumed by the public. The problem is getting bigger when we do not respect the withdrawal time, the time that is needed the antibiotics to get low, in parameters that are allowed in milk for human consumption. Enrofloxacin is part of the antibiotic group of second generation of quinolones or fluoroquinolones, group which is used also in human medicine like ciprofloxacin (8). In this cases we should be more careful as can be created premises for allergies in people who are sensitive to this group of quinolones or pave the way for stimulation of microbial resistance to this group of antibiotics (6).

4. Conclusions

This observation proves that antibiotic residues in milk are a real and serious risk and that should be taken into consideration. The antibiotic residues in milk can be avoided by applying the correct treatment protocols of mastitis in dairy cow, but the challenge of the future is finding and using natural products for the prevention and treatment of mastitis which does not create residues in milk.

5. References

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