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sa međunarodnim učešćem

KNJIGA SAŽETAKA

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BOOK OF ABSTRACTS

Sarajevo, 2022

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Plenarno predavanje

Hemijski kontaminanti mleka i proizvoda od mleka

Radoslava SAVIĆ RADOVANOVIĆ

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Sažetak

Mleko i proizvodi iz mleka, zauzimaju značajno mesto u ishrani ljudi. Pored sastojaka, koji se normalno nalaze u mleku mogu da sadrže u manjoj ili većoj količini druge supstance, koje se nazivaju kontaminanti. Hemijski kontaminati predstavljaju hemijski rizik, koji može nastati tokom dobijanja, prerade i čuvaja mleka. To su materije koje se uobičajeno ne nalaze u mleku dobijenom "prirodnim procesom" (potpunom i neprekidnom mužom, ispravno držanih i pravilno hranjenih, zdravih muznih životinja). Neke od supstanci se teško razlikuju od prirodnih sastojaka mleka, a neke su potpuno nove u mleku. Aktivnost čoveka i emisija štetnih materija u životnu sredinu utiče na kvantitet zagađenja mleka. Hemijski kontaminanti štetno utiču na organizam muzne životinje i na zdravlje čoveka. Kontaminacija mleka najčešće je posledica namerne upotrebe hemijskih materija u lancu proizvodnje hrane, bilo zbog povećanja proizvodnje (hormoni) ili zaštite zdravlja životinja (antibiotici). Hemijski kontaminanti u organizam muznih životinja dospevaju putem hrane, vode i vazduha i u organizmu muzne životinja se metabolišu i deponuju u tkivima ili izlučuju ekskretima i mlekom. U zavisnosti od porekla i načina delovanja hemijski kontaminanti su, prema Aneksu I Direktive Saveta 96/23 / EC, razvrstani u dve grupe (A i B).

Grupa A- supstance koje imaju anaboličko dejstvo i druge nedozvoljene supstance:

Stilbeni, derivati stilbena, njihove soli i estri; antitireoidni agensi; steroidi (estradiol, progesteron, testosteron, trenbolon i dr.); laktoni rezorcilne kiseline, uključujući zeranol; β-agonisti (klenbuterol, salbutamol; ostala jedinjenja (nitrofurani, hloramfenikol).

Grupa B–veterinarski lekovi i kontaminanti životne sredine:

Antiimikrobne supstance (antibiotici, sulfonamidi i karbadoks); drugi veterinarski lekovi (antihelmintici, ekto- i endoparazitici; kokcidiostatici, uključujući nitromidazole; karbamati i piretroidi; sedativi (trankilajzeri, β-blokatori); nesteroidni anti-inflamatorni lekovi; druge farmakološki aktivne

supstance. Kontaminanti životne sredine su organohlorna jedinjenja uključujući i polihlorovane bifenile; organofosforna jedinjenja; toksični elementi (olovo, arsen, živa i kadmijum); mikotoksini, boje itd. Dodate materije (aditivi) su materije dodate u cilju falsifikovanja mleka). Sistemi kontrole kao što su menadžment kvaliteta i Hazard Analysis Critical Control Points (HACCP) imaju ulogu u prevenciji i kontroli hemijskih kontaminanata u mleku i proizvodima od mleka. U ovom preglednom radu će biti prikazani najznačajniji hemijski kontaminati mleka i proizvoda od mleka, kroz primere iz prakse biće ukazano na značajnu ulogu i multidisciplanarni pristup veterinarske, medicinske i farmaceutske struke za bezbednost hrane, što je impearativ svakog društva.

Ključne reči: *hemijski kontaminanti, mleko, proizvodi od mleka*

Plenary lecture

Chemical contaminants in milk and milk products

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Summary

Milk and milk products take an important place in human diet. In addition to the components, which are normally found in milk, they may contain in smaller or larger quantities other substances, which are called contaminants. Chemical contaminants represent a chemical risk that can occur during the production, processing and storage of milk. They are substances that are not normally found in milk obtained by a "natural process" (complete and continuous milking of properly kept and fed, healthy dairy animals). Some of the substances are hardly distinguishable from the natural ingredients of milk, and some are completely new in milk. Human activity and the emission of harmful substances into the environment affect the quantity of milk pollution. Chemical contaminants cause a harmful effect on the organism of dairy animals and human health. Contamination of milk is most often a consequence of the intentional use of chemical substances in the food production chain, either due to increased production (hormones) or animal health protection (antibiotics). Chemical contaminants enter the organism of dairy animals through food, water and air, and in the organism of dairy animals they are metabolized and deposited in the tissues or excreted by excreta and milk. According to Annex I of Council Directive 96/23/EC, chemical contaminants are classified into two groups (A and B), depending on their origin and mode of action.

Group A - substances characterized byanabolic effect and other illegal substances:

Stilbenes, stilbene derivatives, their salts and esters; antithyroid agents; steroids (estradiol, progesterone, testosterone, trenbolone, etc.); resorcylic acid lactones, including zeranol; β-agonists (clenbuterol, salbutamol; other compounds (nitrofurans, chloramphenicol).

Group B – veterinary drugs and environmental contaminants:

Antimicrobial substances (antibiotics, sulfonamides and carbadox); other veterinary drugs (anthelmintics, ecto- and endoparasitics; coccidiostats, including nitromidazoles; carbamates and pyrethroids; sedatives (tranquilizers, β-blockers); non-steroidal anti-inflammatory drugs; other pharmacologically active substances. Environmental contaminants are organochlorine compounds including polychlorinated biphenyls; organophosphorus compounds; toxic elements (lead, arsenic, mercury and cadmium); mycotoxins, dyes, etc. Added substances (additives) are substances added for the purpose of milk adulteration). Control systems such as quality management and Hazard Analysis Critical Control Points (HACCP) play a role in the prevention and control of chemical contaminants in milk and milk products. In this review, the most important chemical contaminants of milk and milk products will be shown, through examples from practice, the important role and multidisciplinary approach of the veterinary, medical and pharmaceutical professions in food safety will be pointed out, which is an imperative of every society.

Keywords: *chemical contaminants, milk, milk products*