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Interactive effects of insulin and calcium in the fish

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Introduction: Calcium ions lead to the release of acetylcholine in the neuro-muscular junction and cause a kind of spastic paralysis in all animal species. On the other hand, insulin may also produce an immobility associated with hypoglycemic shock. The aim of this study was to investigate a possible interaction between these two chemicals in an experimental fish model. **Materials & Methods:** Thirty three adult Guppy fish of either sex were divided into the following groups: insulin-treated, insulin + CaCl₂ 1%, insulin + CaCl₂ 5%, insulin + CaCl₂ 10%, CaCl₂ 1%, CaCl₂ 5%, and CaCl₂ 10%. The time needed to show immobility by a fish was measured as minutes. They were kept under controlled conditions with de-chlorinated tap water, commercial feed, and sufficient oxygenation. **Results:** Insulin cause immobility in 25.13±1.47 min and calcium alone at concentrations 1%, 5%, and 10% led to similar effect in 11.73±0.88 min, 6.67±1.47 min, and 2.53±0.39 min, respectively. Together with insulin, the time needed to start immobility was 16.00±4.48 min, 6.19±1.05 min, and 2.59±0.23 min in the groups treated with 1%, 5%, and 10% CaCl₂ respectively. Therefore, presence of calcium declined the time needed for insulin to induce coma in the fish (P<0.05). However, without insulin too, calcium caused a similar immobilizing effect. Calcium-treated animals died within a short time after the experiment irrespective of the use of insulin. In the groups treated with insulin + CaCl₂ a mass lethal effect was observed: all fish in the group 10%, 4 out of 6 in the group 5% and 1 out of 6 in the group 1% died shortly after the experiment. **Conclusion:** Calcium added to the medium even at a low concentration of 1% may cause a lethal effect in the fish. Insulin-induced coma may not be treated with calcium as the immobility and coma seen in hypoglycemic patients is not calcium-dependent.

Keywords: Fish, Insulin; Hypoglycemia, Calcium, Guppy

Screening of the Tetracycline Residues in Different Brands of Pasteurized Milks Distributed in Tehran, Iran

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Antibiotic residues in foods may cause serious public health problems. Even consumption of low doses of antimicrobials for a long period of time, may lead to toxic or allergic reactions in human and also spread of drug resistant-microorganisms. Tetracyclines (TCs) are broadly used in dairy cattle for prevention and treatment of mastitis and are effective against a wide range of bacteria. The maximum residue level (MRL) for TCs in milk is 100µg/Kg for oxytetracycline, chlortetracycline and tetracycline and 0µg/Kg for doxycycline. Widespread use of TCs in dairy animal therapeutics and also increasing production and consumption of dairy products in Tehran was an ambitious to plan a survey on wide spectrum antibiotics by a proper screening method and determination of desired TCs in positive milk samples by a selective HPLC method. 56 samples of milk were selected randomly according to the statistical methods from different brands distributed in Tehran. All of them were tested by Delvo® sp kit to verify the presence of antibiotics more than MRL levels. The positive samples (17 samples) were selected for detection of tetracyclines by a simple isocratic HPLC method. In the screening (Delvo) test 30.36% of the samples had antibiotic residues greater than MRL, from which 7.1% were TCs (by HPLC results), and others (23.26) were from another antimicrobial classes. Oxytetracyclines and tetracyclines in all samples were lower than MRL, but chlortetracycline in two samples and doxycycline in three samples were greater than MRL. Simultaneous contamination of oxytetracycline, tetracycline and chlortetracycline was detected in one sample. According to the public health concerns of the above results, we suggest that: 1- Withdrawal time of antimicrobials in dairy cattle must be more observed by farmers and veterinarians and also enforced by governmental food safety organisations 2- More research is needed on the samples of another provinces and also country wide. This project funded by the secretariat of applied research in the deputy Ministry for Food & Drugs, MOHME (Ministry of health and Medical Education) of Iran.

Keywords: Tetracyclines, milk, residue, HPLC