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Physiological, biochemical and histometric responses of Nile tilapia (*Oreochromis niloticus* L.) by dietary organic chromium (chromium picolinate) supplementation

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Chromium has been recognized as a new and important micro-nutrient, essential for both human and animal nutrition. This study was conducted to evaluate the appropriateness and/or the use of safety level of dietary chromium picolinate (Cr-Pic), and its effects on the physiological responses, the histometric characteristics, and the chemical analysis of dorsal muscles of mono-sex Nile tilapia, *Oreochromis niloticus*. A total of 420 fingerlings (28.00±0.96 g) were randomly distributed into 21 fiberglass tanks representing seven treatments at a rate of 20 fish m⁻³. The control fish group (T1) was fed a Cr-Pic free basal diet. Other fish groups were fed the basal diet supplemented with 200 (T2), 400 (T3), 600 (T4), 800 (T5), 1000 (T6) and 1200 µg Cr-Pic kg⁻¹ diet (T7). Diets were offered to fish at a feeding rate of 3% of life body weight for 12 weeks. Results revealed that blood hematological parameters (hemoglobin, red blood cells, packed cell volume, mean corpuscular hemoglobin concentration, blood platelets, and white blood cells lymphocytes); serum biochemical measurements (total testosterone, high density lipoprotein, total protein, albumin, and globulin); and the dry matter and crude protein of the fish dorsal muscles all have significantly increased ($P \leq 0.05$) in the T3 treatment compared with the other treatments. Meanwhile, no significant differences were found among all treatments with regard to the histometric characteristics. It can be concluded that Cr-Pic at 400 µg kg⁻¹ diet (T3) seems to be the most appropriate level for *O. niloticus* fingerlings.

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The cost of improving patient care: Pharmaceutical pricing in the EU and USA

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We are unfortunately subject to an optimistic bias when we evaluate how, and to what extent, drugs and other medical therapies will become available and accessible to patients on the global level in which pharmaceutical enterprises operate. In developed countries, the pricing and affordability of medicines is a controversial issue that highlights health and economic inequalities, and great challenges for the future. According to the New York Times article *Lawmakers Look for Ways to Provide Relief for Rising Cost of Generic Drugs* (November 24th 2014), "the cost of many generic medications has increased so much over the past year that prices for many common generic drugs in the USA have surpassed those of their brand-name equivalents in other developed countries". The issue of unaffordable healthcare is rendered more challenging with technological advances and the demographic growth of the geriatric population, including those with cancer and cardiac disease. Legislation can be instrumental in the creation of equitable solutions. The unique experience of the Republic of Malta as a small-island EU member state to manage healthcare access and drug entry into its national health service; implement regulatory requirements aimed at ensuring quality, safety, and efficacy of medicines and vaccines for human use; and the European Transparency Directive (Council Directive 89/105) which defines procedural requirements for pricing and reimbursement of medicinal products will be discussed. These issues must be taken into account since few of the hundreds of drugs in clinical development ever reach the stage of final approval, having failed to produce the anticipated results expected by the investigators. These trials can take up to 20 years to complete, and several billion dollars to reach the stage of approval or denial by the regulatory agency involved. When failing to demonstrate viability, pre existing expenditures are allowed to be passed onto the price the pharmaceutical company charges patients. In the cancer industry for example, most new drugs require the patient or insurance company to pay 50-100,000 dollars for a course of treatment which may not offer more than several months of improvement in the clinical response. It is essential that the legislators in each of the countries where the drug is to be introduced be able to negotiate a fee arrangement where the patient will not be denied treatment and the drug company be compensated reasonably for development costs.

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