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Detoxification of Linseed and Sesame Meal and Evaluation of their Nutritive Value in the Diet of Common Carp (*Cyprinus carpio* L.)

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Abstract

The effect of two processing methods, aqueous extraction and autoclaving (120°C, 1 kg.cm⁻², 2 hours) for detoxifying linseed (*Linum usitatissimum*) and sesame meals (*Sesamum indicum*) on their nutritive value as a protein source for common carp was evaluated. Growth and feed utilization of carp fed diets with 25% of the total protein replaced by linseed or sesame seeds, which are either untreated, heat treated or aqueous extracted, were compared to a control diet with fishmeal as the sole protein source. The seven diets were made isonitrogenous (40% protein) and isocaloric (4.4 Kcal.g⁻¹) and were fed to carp initially weighing 3.3 g in three replicate tanks. Both methods of processing did not alter significantly the proximate and amino acid composition of the meals. Phytic acid contents were reduced by 48.2-71.8% and 50.8-74.0% in linseed and sesame meals, respectively with heat treatment resulting in greater reduction. Hydrocyanic acid content in linseed meal was reduced by 34.4-53.1%, with aqueous treatment resulting in the greater reduction. The results of the feeding trial showed that use of detoxified meals in diets significantly ($P < 0.05$) improved growth performance and food utilization of carp compared to those fed untreated meals but not to a level of performance obtained with a fish meal based control diet.

Introduction

Apart from amino acid imbalances, endogenous antinutritional factors are the main factors limiting the use of plant feedstuffs at high levels in animal and fish feeds. Phytic acid is one of the major toxic factors in both linseed and sesame meals (Erdman 1979;