# Effect of Polyunsaturated Fatty Acid Feed Supplements in Broiler Turkeys

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Growing consumer interest in health and nutrition has intensified the search for strategies to produce foods with enhanced functional value. In recent years, research in functional foods has focused on enriching human diets with omega-3 and omega-6 fatty acids. Long-chain omega-3 fatty acids—particularly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)—are associated with numerous health and longevity benefits, increasing interest in foods naturally enriched with these nutrients. In poultry production, essential fatty acids are increasingly emphasized not only for improving bird health and productivity but also to meet consumer demand for nutritionally balanced animal products.

Flaxseed and microalgae have emerged as promising dietary supplements for increasing omega-3 content in poultry meat. This study investigated the effects of supplementing broiler turkey diets with omega-3–rich additives on production performance, slaughter traits, and the fatty acid profile of meat. Turkeys received either microalgae meal (1% or 2%; algae cultivated in a closed, controlled system) or a flaxseed- and cereal-based product (0.5%), and were compared with unsupplemented controls. Live weight, daily weight gain, feed conversion, and slaughter characteristics were recorded. Fatty acid composition of breast and thigh meat was determined using gas chromatography after extraction and conversion to methyl esters, and expressed as a percentage of total identified fatty acids. Total PUFA (polyunsaturated fatty acid) content and the omega-6/omega-3 ratio were also calculated.

Turkeys receiving 2% and 1% microalgae meal achieved the highest final live weights (8.935 kg and 8.418 kg, respectively), outperforming both the flaxseed group (7.903 kg) and controls (7.543 kg). Birds supplemented with 2% microalgae also showed a 14% reduction in feed intake compared with controls and the flaxseed group. Meat from all supplemented groups displayed higher omega-3 fatty acid content and lower omega-6/omega-3 ratios than controls.

Overall, the findings demonstrate that flaxseed and microalgae supplementation effectively enhances growth performance and enriches turkey meat with omega-3 fatty acids, supporting their use as functional feed additives in poultry production.

**Key words**: Turkey's meat, Productivity, Algae, Linseed, Fatty acid ratio (ω6/ω3)

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