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Effect of hydroponic maize fodder supplementation on growth performance, carcass traits, and economic value of Sasso T44 chickens in Shire, Tigray, Ethiopia

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Abstract

This study was conducted to evaluate hydroponic maize fodder (HMF) as a cost-effective and sustainable alternative to conventional poultry feed, in response to rising feed costs. The effects of different inclusion levels of HMF (0 %, 10 %, 20 %, and 30 %) on growth performance, carcass characteristics, and economic returns of Sasso T44 chickens were investigated.

A total of 192 birds, aged 28 days, were randomly assigned to four dietary treatments in a completely randomised design, with three replicates of 16 birds per treatment. Parameters measured included body weight gain, average daily gain (ADG), feed intake, feed conversion ratio (FCR), dressing percentage, and economic indicators such as net return and marginal rate of return.

Highly significant differences ($p < 0.001$) were observed among treatments. Birds fed 10 % (T2) and 20 % (T3) HMF performed better than those in the control (T1) and 30 % (T4) groups. The highest final body weight was recorded in T2 (1726.25 g), followed by T3 (1615 g). Similarly, T2 and T3 showed higher weight gain (1308.54 g and 1193.61 g) and ADG (37.39 g day^{-1} and 34.10 g day^{-1}), respectively. Feed efficiency improved in these groups, with lower FCR values of 2.27 (T2) and 2.36 (T3), compared to 2.60 (T1) and 2.79 (T4).

Carcass traits followed a similar trend, with significantly higher slaughter and carcass weights observed in T2 (1913 g and 1120.28 g) and T3 (1886.33 g and 1037.17 g) ($p < 0.01$). Economic analysis indicated that increasing HMF levels reduced feed costs, with the 10 % inclusion level yielding the highest profitability. T2 generated the highest total return (840 ETB per bird) and net income (515 ETB per bird), with a net return of 180 $^{\text{ETB}}/_{\text{bird}}$ based on partial budget analysis.

In conclusion, moderate inclusion of HMF, particularly at 10 %, significantly enhanced growth performance, carcass yield, and economic efficiency of Sasso T44 chickens. Further studies are recommended to evaluate its effects on digestion, health, and long-term productivity.

Keywords: Carcass yield, feed conversion ratio, growth performance, hydroponic maize fodder, poultry economics, Sasso T44

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