

### 98. The effect of mezquite pod flour in a wheat-based diet on broiler chicken growth performance

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**Application** Inclusion of Mezquite pod flour in broiler chicken diets significantly reduced weight gain, this could inform a recommendation against the use of non-processed Mezquite in broiler chicken diets.

**Introduction:** Mezquite is an under-utilised crop and a possible alternative to soybean. Mezquite is part of the genus *Prosopis*, a group of leguminous trees. Their pods, containing seeds, are valued for their nutrition and are often ground into flour with 7–17% protein [1]. There are few studies looking at feeding pods to monogastric species, but Girma et al. [2] found that a 30% inclusion reduced growth and feed intake in broiler chickens, while a 10 or 20% inclusion had no significant effect. This study aimed to assess the impact of a 15% inclusion of Mezquite pod flour on broiler chicken growth and performance.

**Materials and Methods** This trial was approved by the Animal Welfare & Ethical Review Body at the University of Nottingham. Eighty, one day old Ross 308 Broiler chickens were group housed for 6 days before being split into 20 pens of 4. Birds were fed either *ad-libitum* wheat-soya based diet (CON n = 40), or 15% inclusion of non-processed ground Mezquite pod (*Prosopis juliflora*) (MEZQ n = 40); collected from the Baringo area, Kenya. Both diets were balanced for equivalent energy and protein content, predominantly replacing wheat. Feed intake and weights were recorded twice weekly, before culling on days 35 and 36. The right

breast muscle and liver were dissected and weighed. Data was analysed by one-way (treatment) or two-way (time × treatment) ANOVA (Genstat 19th edition), with significance taken as  $p < 0.05$ .

**Results:** A 15% inclusion of Mezquite pod flour in the diet negatively affected weight gain and FCR. A two-way ANOVA showed a significant interaction between time and feed for weight gain (data not shown), due to significantly higher growth of CON broilers. Mezquite inclusion therefore significantly decreased the final bodyweight ( $P < 0.001$ , one-way ANOVA). Total feed intake was similar, resulting in a significantly higher FCR for the MEZQ group ( $p < 0.001$ , one-way ANOVA). CON breast muscle weights were significantly higher ( $p < 0.001$ , one-way ANOVA). Liver weights were taken as an indication of effects on metabolic active tissues, but these were similar (Table 1).

**Conclusion:** These results suggest that Mezquite pod inclusion affects feed utilisation. This could be due to antinutritional factors, such as tannins or trypsin inhibitors, inhibiting digestion. Further study is needed to identify if antinutritional factors are responsible, and whether post-harvest processing or the use of exogenous enzymes reduces the negative impact.

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### References

- [1] Ellsworth SW, Crandall PG, Lingbeck JM, O'Bryan CA. *IForest- Biogeosci Forestry*. 2018;11(5):577–585.
- [2] Girma M, Urge M, Animut G. *Int J Poultry Sci*. 2011;10(12):970–976.

Table 1

The effect of inclusion of Mezquite pod flour on broiler chicken growth, expressed as an average per bird at 36 days.

	Initial BWt (g)	Final BWt (kg)	Total Feed intake (kg)	FCR	Breast muscle wt (% of BWt )	Liver wt (% of BWt )
Control	129.1	1.99	2.93	1.42	0.061	0.025
Mezquite	131.5	1.57	2.90	2.03	0.054	0.024
SED <sup>1</sup>	2.3	0.07	0.13	0.08	0.002	0.001
P-value	0.298	< 0.001	0.847	< 0.001	< 0.001	0.240

<sup>1</sup>SED = standard error of the differences of the means. BWt = Body weight, wt = weight.