

Área: ORG

Sustainable utilization of chicken viscera for the production of protein hydrolysates

Larissa Echeverria* (PQ),¹ Mônica L. Fiorese (PQ),¹ Carina C. T. de Almeida (PQ),¹ Thaynara M. Z. Schäfer (PG),¹ Joacir J. N. Piana (PG),¹ Ana M. dos S. Camargos (PQ),² Giovana S. M. Diz (PQ).²

larissaecheverria@hotmail.com; larissaecheverria@hotmail.com

¹Department of Chemical Engineering, UNIOESTE – Toledo Campus; ²PROZYN Industry and Commerce LTDA

Keywords: (Waste valorization, Protein hydrolysates, Chicken, Sustainability).

Highlights

Chicken viscera can be converted into functional, bioactive, and highly digestible hydrolysates through enzymatic hydrolysis.

Protezyn AVF produces highly digestible hydrolysates rich in peptides <3 kDa.

Abstract

The valorization of residual raw materials is essential to promote sustainability in food production. In poultry farming, large volumes of chicken waste are generated, including viscera. Despite their utilization potential, poultry slaughter by-products remain underused, negatively contributing to environmental impacts. Among the valorization alternatives, enzymatic hydrolysis stands out by converting protein-rich residues into hydrolysates composed of peptides and free amino acids, with functional, bioactive, and nutritional properties (Five *et al.*, 2024). In this context, the present study aimed to hydrolyze chicken viscera using two different enzymes. For the production of protein hydrolysates, experiments were conducted in a jacketed reactor. The following enzymes were tested: Alcalase 2.4L (Novonesis): 0.15% w/w and Protezyn AVF (Prozyn): 0.054% w/w. The hydrolysates produced were evaluated for degree of hydrolysis (DH), protein recovery (PR), molecular weight distribution, and digestibility. Table 1 presents the results for DH, PR, molecular weight (<3 kDa), and digestibility for the hydrolysates produced with Protezyn AVF and Alcalase 2.4L.

Table 1 – Results obtained for the characterization of the protein hydrolysates produced.

Hydrolysate	DH (%)	PR (%)	Molecular weight <3 kDa (%)	Digestibility (%)
Protezyn AVF	66	82	94	95
Alcalase 2.4L	60	83	92	97

The effectiveness of enzymatic hydrolysis is evaluated by the DH and PR. The DH reflects the extent of protein breakdown into peptides and amino acids, while the PR indicates the amount of soluble protein obtained, which is directly related to the digestibility and nutritional value of the product. In this study, Protezyn AVF resulted in a slightly higher DH than Alcalase 2.4L, while the PR and digestibility values were similar high. Regarding the molecular profile, Protezyn AVF produced a higher proportion of peptides with a molecular weight below 3 kDa. Both enzymes were effective in producing nutritious protein hydrolysates, confirming the potential of chicken viscera as a source for functional, high value-added ingredients.

FIVE, K. K. *et al.* Enzymatic hydrolysis of chicken viscera and bones: Rest raw material characterization and evaluation of industrially relevant process parameters on product yields. *Process Biochemistry*, v. 146, p. 68-80, 2024.

Acknowledgments

We thank UNIOESTE for the infrastructure, the Sustainable Engineering Laboratory for technical and scientific support, and Prozyn Company for their partnership enabling this research.