Meat Analogues: Nuggets and Hamburgers

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LIKE-A-PRO is a EU-funded project aiming to facilitate sustainable and healthy diets by mainstreaming alternative proteins and products, making them more available, accessible and acceptable.

Benefits of alternative meat analogues

Alternative protein-based nuggets and hamburgers offer opportunities to diversify protein sources while responding to consumer demands for convenient, sustainable food products. By replicating familiar meat formats, these alternatives facilitate the adoption of diversified diets, particularly among flexitarian and health-conscious consumers. Their combination of protein enrichment, dietary fibre and familiar eating experiences would enable manufacturers to differentiate their portfolios within established convenience-food categories.

Development challenges

Developing competitive meat analogues requires balancing nutritional quality with sensory performance, particularly taste, texture and appearance. Alternative protein ingredients may introduce off-flavors, while ensuring product stability and microbiological safety throughout storage remains essential. Manufacturers must also achieve consistent processing performance, industrial compatibility and cost-effective scalability.

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CNTA's solution

Within LIKE-A-PRO, CNTA developed alternative protein-based nuggets and hamburgers designed to replicate conventional chicken and beef products while improving their nutritional profiles. Three formulations were developed for each category: 1) Pea, insect protein and fungi-lentil nuggets 2) Fava bean, insect protein and fungi-lentil hamburgers.

The nuggets were developed using extrusion-based structuring technology, while the hamburgers incorporate CNTA's proprietary Veggian® technology to produce minced meat alternatives from vegetable ingredients. Both product concepts demonstrated promising nutritional, sensory and refrigerated storage performance, with processing approaches designed for integration into conventional manufacturing systems. The developed solutions offer four key advantages:

Enhanced nutritional value and protein quality

All nugget formulations qualify as "high protein" (17.54–28.43 g/100 g), exceeding the protein levels of the commercial benchmarks analysed. Burgers provide 10.74–14.30 g protein and 8.83–9.77 g fibre per 100 g, qualifying as both "high protein" and "high fibre". All formulations also meet the criteria for "low sugars" claims.

Validated stability and sensory acceptability

Refrigerated shelf-life studies demonstrated stability for at least 55 days in nuggets and 21 days in burgers. Microbiological and physicochemical assessments supported product stability, while sensory evaluations confirmed acceptable characteristics in selected formulations, with some opportunities for flavour and texture optimisation.

Flexible formulations and simplified ingredient profiles

The use of diverse alternative protein sources enables formulation adaptability and raw material diversification. Relatively short ingredient lists based on recognisable components also support cleaner-label positioning and greater ingredient transparency.

Industrial compatibility and scale-up potential

Nuggets incorporate PowerHeater™ extrusion technology, while burgers use CNTA's proprietary Veggian® technology. Both approaches are designed for integration into conventional manufacturing lines with limited modifications, supporting future industrial scale-up and technology transfer.

Commercial potential and B2B value proposition

CNTA's meat analogues offer opportunities in the growing alternative protein market, particularly within retail, foodservice and private-label convenience-food categories. Through a B2B model focused on technology transfer, licensing and formulation support, CNTA enables food manufacturers to develop differentiated nuggets and burgers while reducing technical development complexity. Their nutritional advantages, familiar formats and compatibility with existing production infrastructure provide a foundation for future industrial validation and commercialisation.

Overall, CNTA's developments within the LIKE-A-PRO project demonstrate the potential of alternative protein ingredients to deliver nutritionally enhanced and consumer-relevant meat analogues. By combining high protein and fibre content, acceptable sensory performance and industrially compatible processing approaches, CNTA's nugget and burger concepts offer a promising pathway towards next-generation convenience foods, supporting product innovation and new commercial opportunities in the alternative protein market.

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