

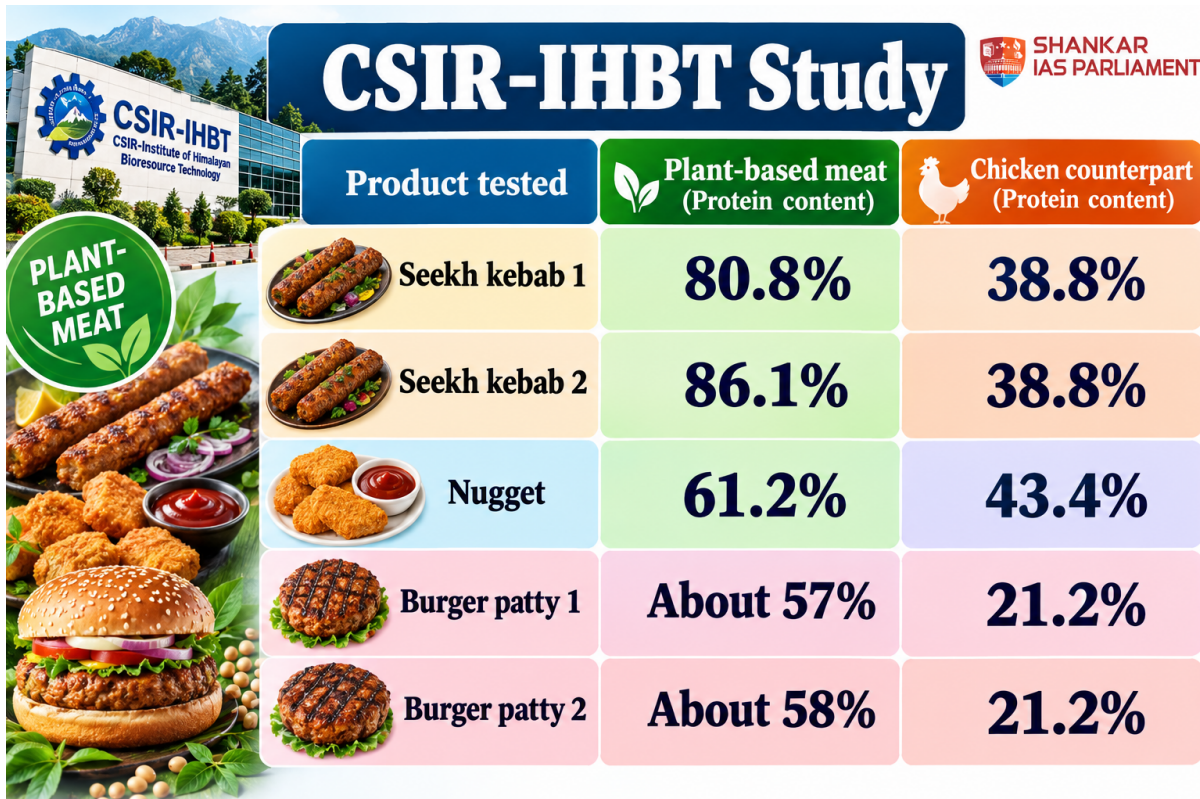
Plant-Based Meat Yields

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Why in News?

A recent study demonstrated that 5 evaluated plant-based meat products exhibited a greater percentage of protein bioavailability compared to their chicken counterparts.

- **Conducted by** - CSIR-Institute of Himalayan Bioresource Technology (CSIR-IHBT), Palampur.
- **Collaboration with** - Good Food Institute (GFI) India.
- **Conducted under** - Laboratory-simulated digestion.
- **Key findings**



The infographic features a background image of the CSIR-IHBT building and a collage of plant-based meat products including seekh kebabs, nuggets, and burger patties. A green circular badge on the left reads 'PLANT-BASED MEAT'. The table compares the protein bioavailability of five plant-based products against their chicken counterparts.

Product tested	Plant-based meat (Protein content)	Chicken counterpart (Protein content)
Seekh kebab 1	80.8%	38.8%
Seekh kebab 2	86.1%	38.8%
Nugget	61.2%	43.4%
Burger patty 1	About 57%	21.2%
Burger patty 2	About 58%	21.2%

- Plant-based products demonstrated greater measured protein bioavailability across all five comparative analyses.
- Chicken products contained higher levels of crude protein and released a greater quantity of amino acids during digestion.
- The study focused exclusively on **protein bioavailability** rather than assessing

overall health outcomes.

- Additional testing with a broader range of products and increased sample sizes is planned.

Protein bioavailability

- Protein bioavailability is defined as the extent to which a nutrient becomes available for absorption and utilization by the body.
- During digestion, proteins are hydrolyzed into amino acids and smaller peptides.
- Amino acids are utilized for tissue growth and repair, enzyme synthesis, and various physiological functions.

In vitro digestion

- In vitro refers to processes conducted outside a living organism, typically in a laboratory setting.
- The study employed the internationally harmonized INFOGEST protocol to simulate human digestion.
 - **Salivary phase** - Samples were subjected to a simulated salivary phase with a duration of two minutes.
 - **Gastric phase** - Digestive enzymes were applied under acidic conditions, maintaining a pH range of 2 to 3.
 - **Intestinal phase and ultrafiltration** - A membrane replicating human intestinal pore size was utilized.
- The concentration of free amino acids passing through the membrane was measured to estimate bioavailability.
- Each sample was standardized to contain 40 mg of protein at the start of the experiment.
- Animal studies continue to serve as a critical benchmark for assessing biological effects, although they require additional time and ethical approval.
- The researchers plan to conduct inter-laboratory testing to facilitate broader adoption of the method, including implementation by NABL-accredited laboratories.

Plant-Based Meat Products

- Plant-based meat products are formulated to replicate the taste, texture, and appearance of animal-derived meat by utilizing plant-based ingredients.
- Common raw materials used in plant-based meat production include:
 - Soy protein
 - Pea protein
 - Wheat gluten
- **Manufacturing technique - Extrusion**
- During extrusion, the material is forced through a shaped die under controlled heat and pressure, resulting in a meat-like texture.

Plant-based meat vs conventional meat

Feature	Plant-based meat	Conventional meat
Primary source	Plant proteins	Animal tissues

Protein content	Depends on formulation	Depends on meat type and cut
Dietary fibre	Can provide dietary fibre	Contains no dietary fibre
Saturated fat and sodium	Depend on ingredients and processing	Depend on meat type and preparation
Environmental impact	May offer sustainability benefits, depending on production	Depends on livestock system and supply chain

Reference

[The Hindu | Plant-Based Meat Yields](#)

