

# Comparing the physical characteristics of plant-based and conventional Italian sausage

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## Objective

Measure and compare the cookability, internal color, external color, pH, water activity, and moisture content of seven U.S. commercially available plant-based Italian sausages with four U.S. commercially available conventional pork Italian sausages.

## Background

- The World Health Organization classifies processed meat as carcinogenic to humans. Sausage is the second most consumed processed meat in America.
- A significant shift in consumer dietary behavior towards plant-based sausage is necessary.
- The plant-based industry must address this concern by creating alternative products that can effectively mimic the physical properties of conventional pork Italian sausage.

## Sample Description

Protein Source	Flavor

Figure 1. Conventional (control) and plant-based sausages included 4 protein sources: pork, pea protein concentrate, vital wheat gluten, and soy protein.

## Method

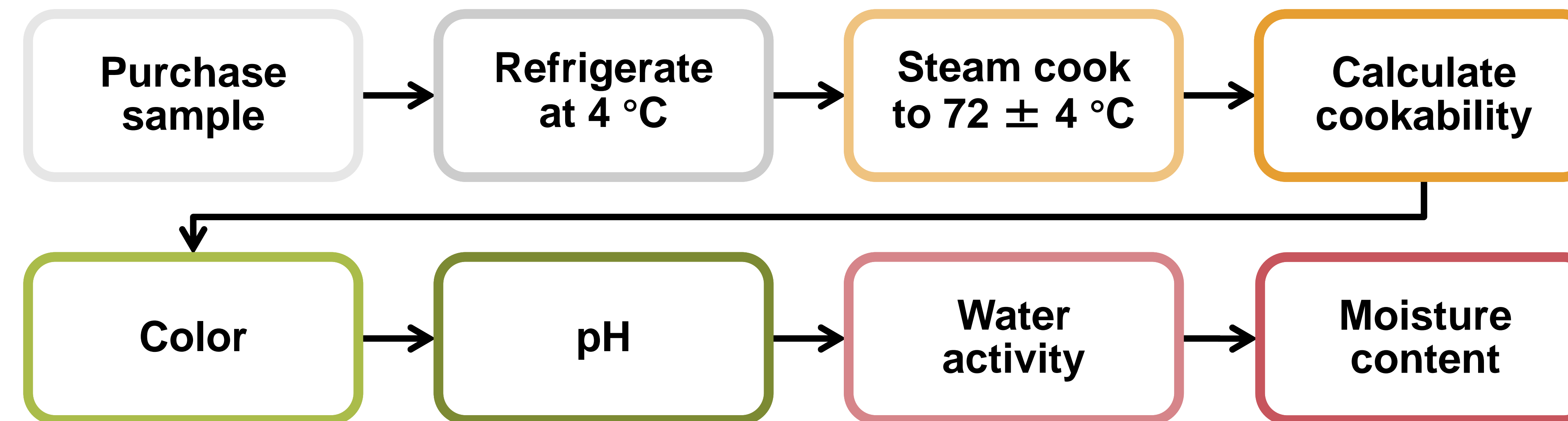


Figure 2. Process flow diagram describing measurements taken.

## Results

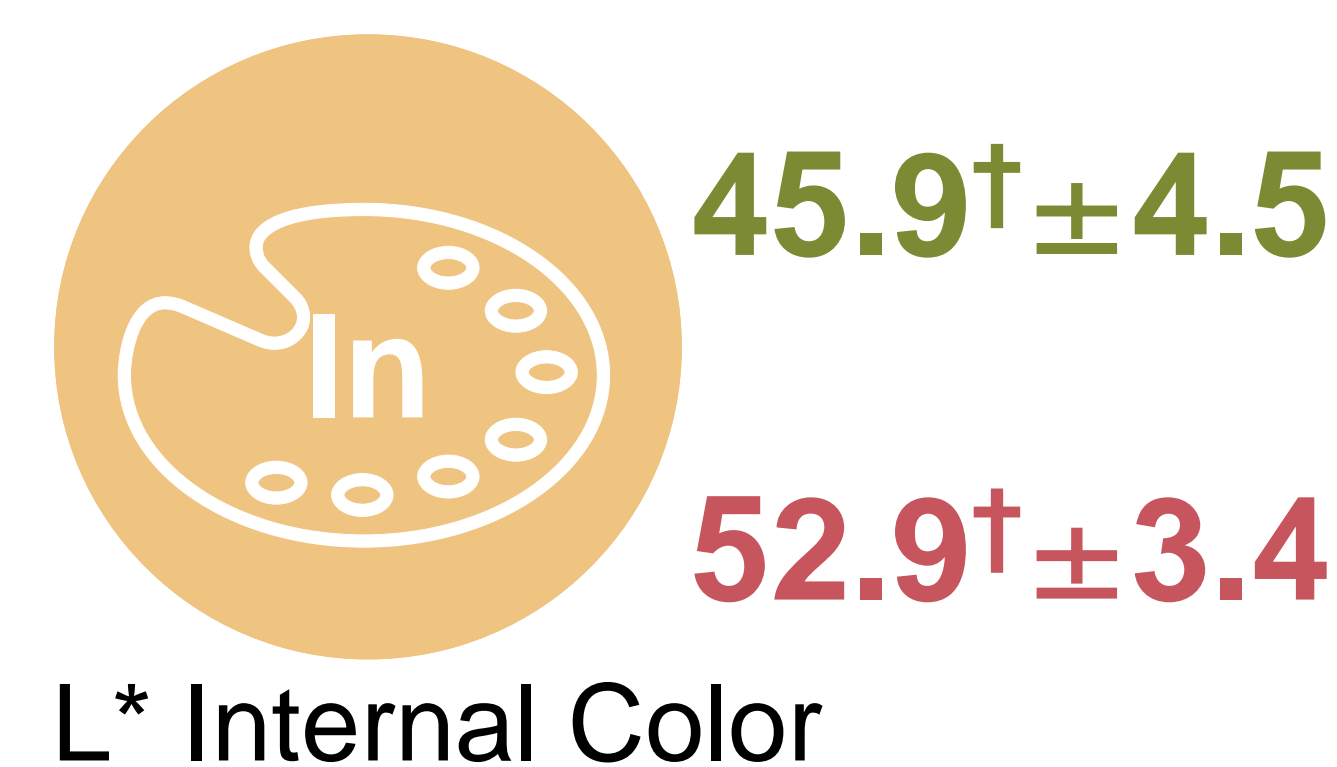


Figure 3. Boxplot displaying the significant difference ( $p < 0.05$ ) between plant-based and meat Italian sausage when measuring internal lightness. Samples were cut by a cross section to measure internal L\*.



Figure 4. Mean  $\pm$  SD for each physical attribute. Green numbers represent plant-based samples. Pink numbers represent meat samples.

## Discussion & Conclusion

- Only the internal L\* (measure of lightness) significantly differed between plant-based Italian sausage and meat Italian sausage,  $p = 0.02$ .
- Pork Italian sausage had, on average, a lighter internal color than plant-based sausage. Before consumers even taste the product, they observe the internal color. The relationship between sausage color and consumer acceptance can be further explored.
- Relatively high standard deviations in the plant-based cookability and moisture content values reflect the varied protein sources of the plant-based samples.
- The improvement of plant-based sausages has the potential to significantly alter the standard American diet: consumers provided with quality, realistic meat analogues will be further empowered to choose plant-based products.
- Next steps:**
- Texture as an additional physical attribute could have a major influence on consumer acceptance of a product. A future sensory test can determine how the texture of sausage affects consumer preferences.

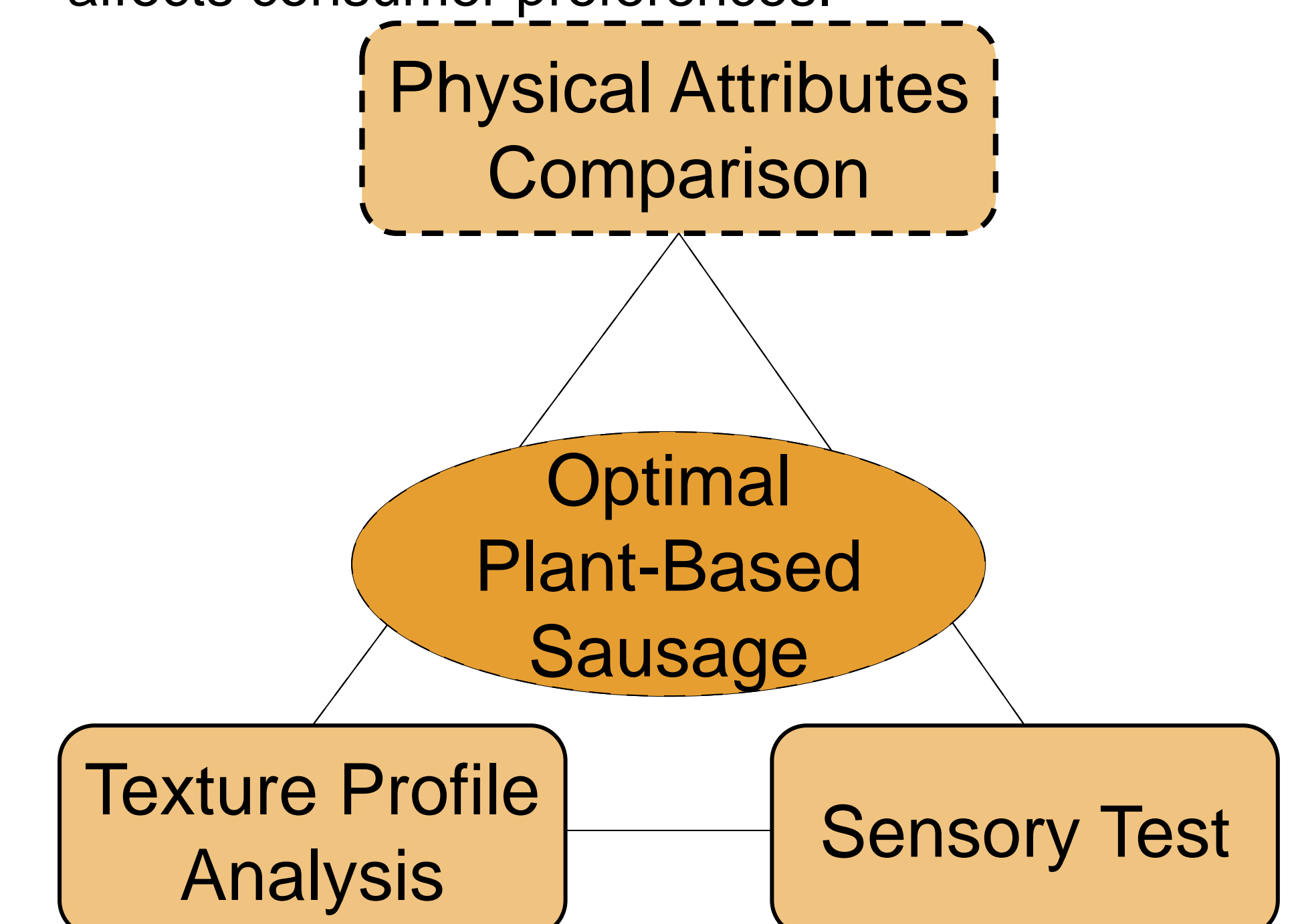


Figure 5. Three components that can guide the plant-based industry towards developing a plant-based sausage that closely mimics pork sausage.

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