

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

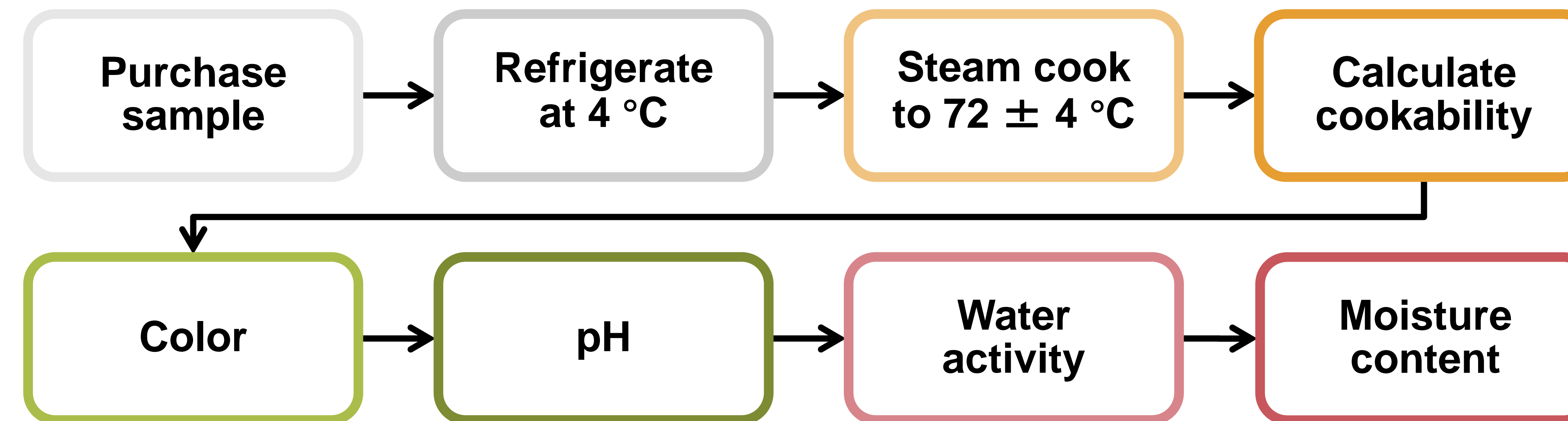


Figure 2. Process flow diagram describing measurements taken.

Results

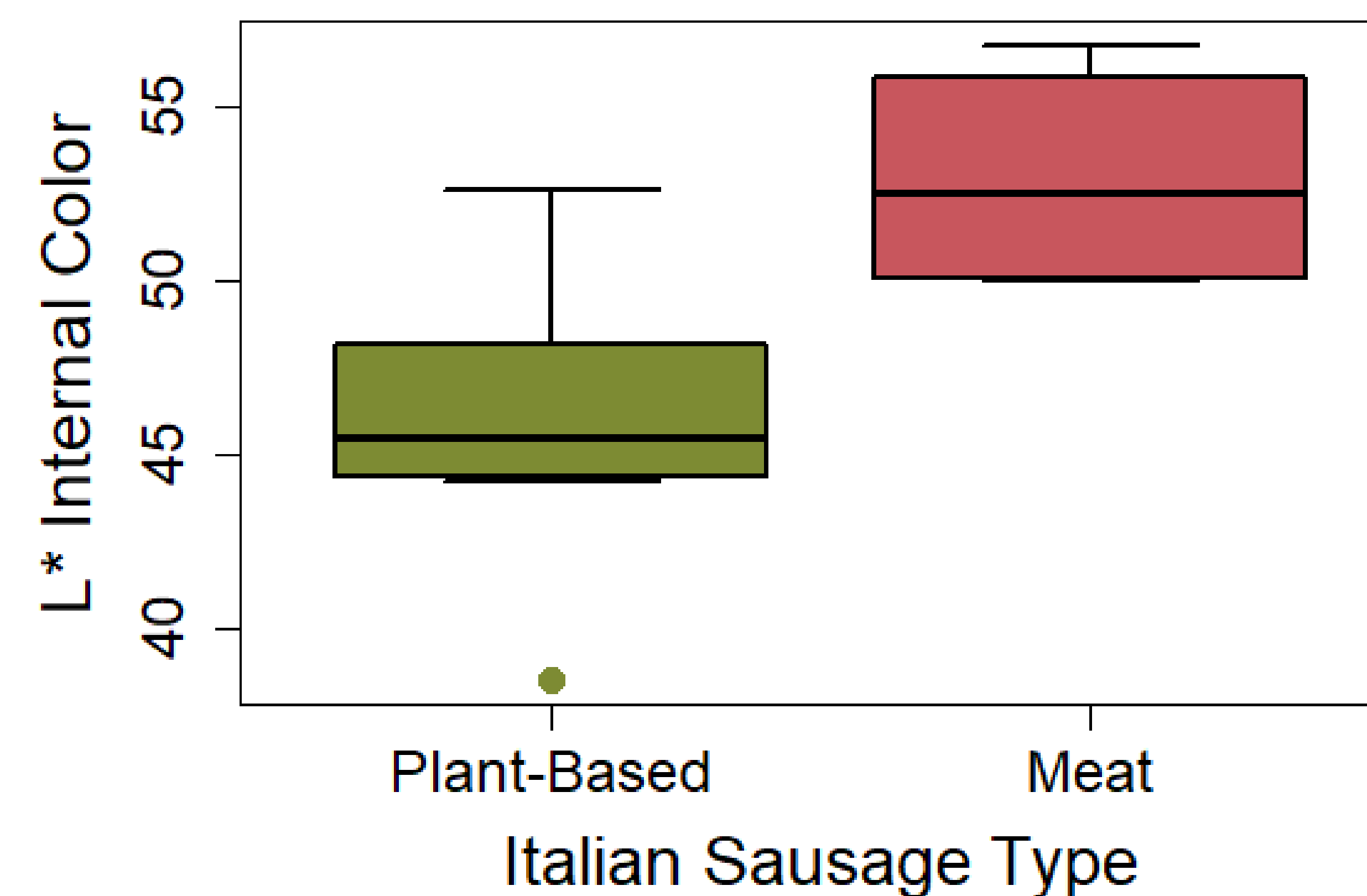
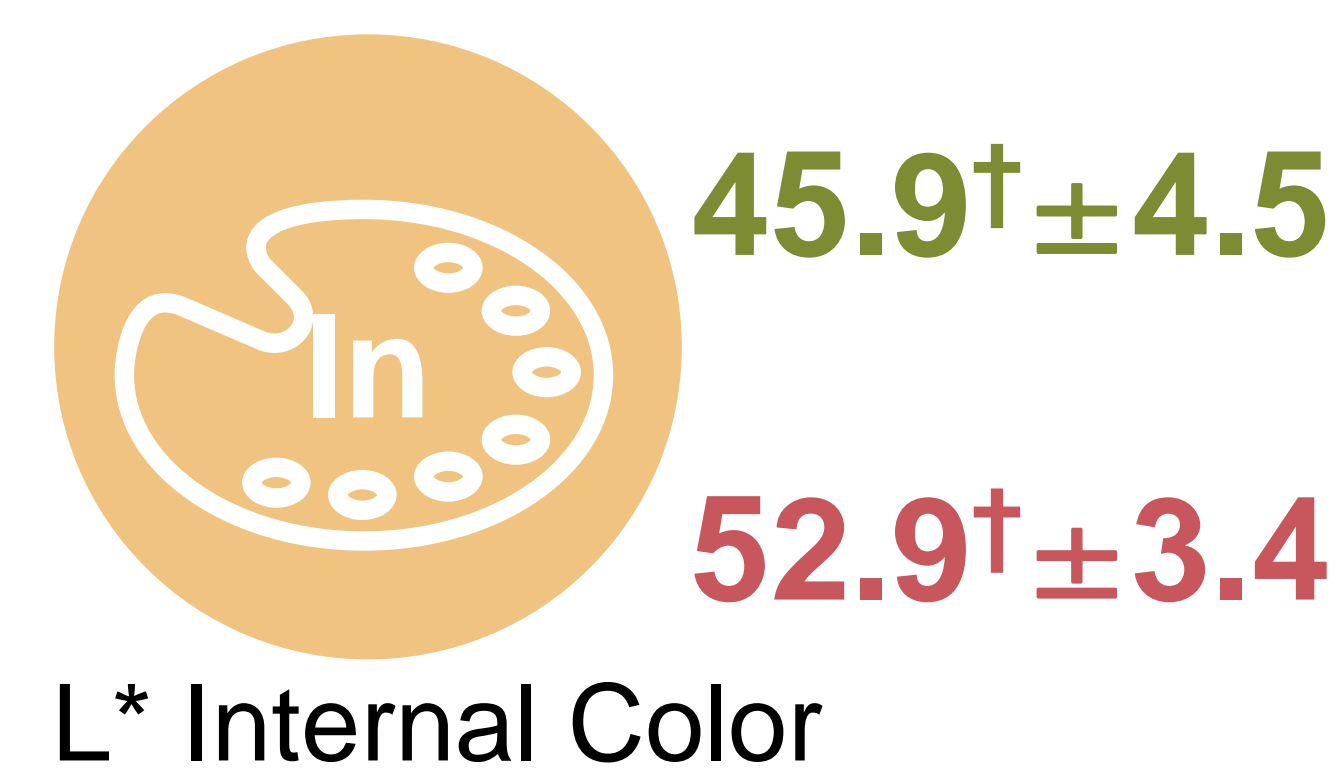


Figure 3. Boxplot displaying the significant difference ($p < 0.05$) between plant-based and meat Italian sausage when measuring internal lightness. Samples were cut by a cross section to measure internal L*.



Figure 4. Mean ± 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.

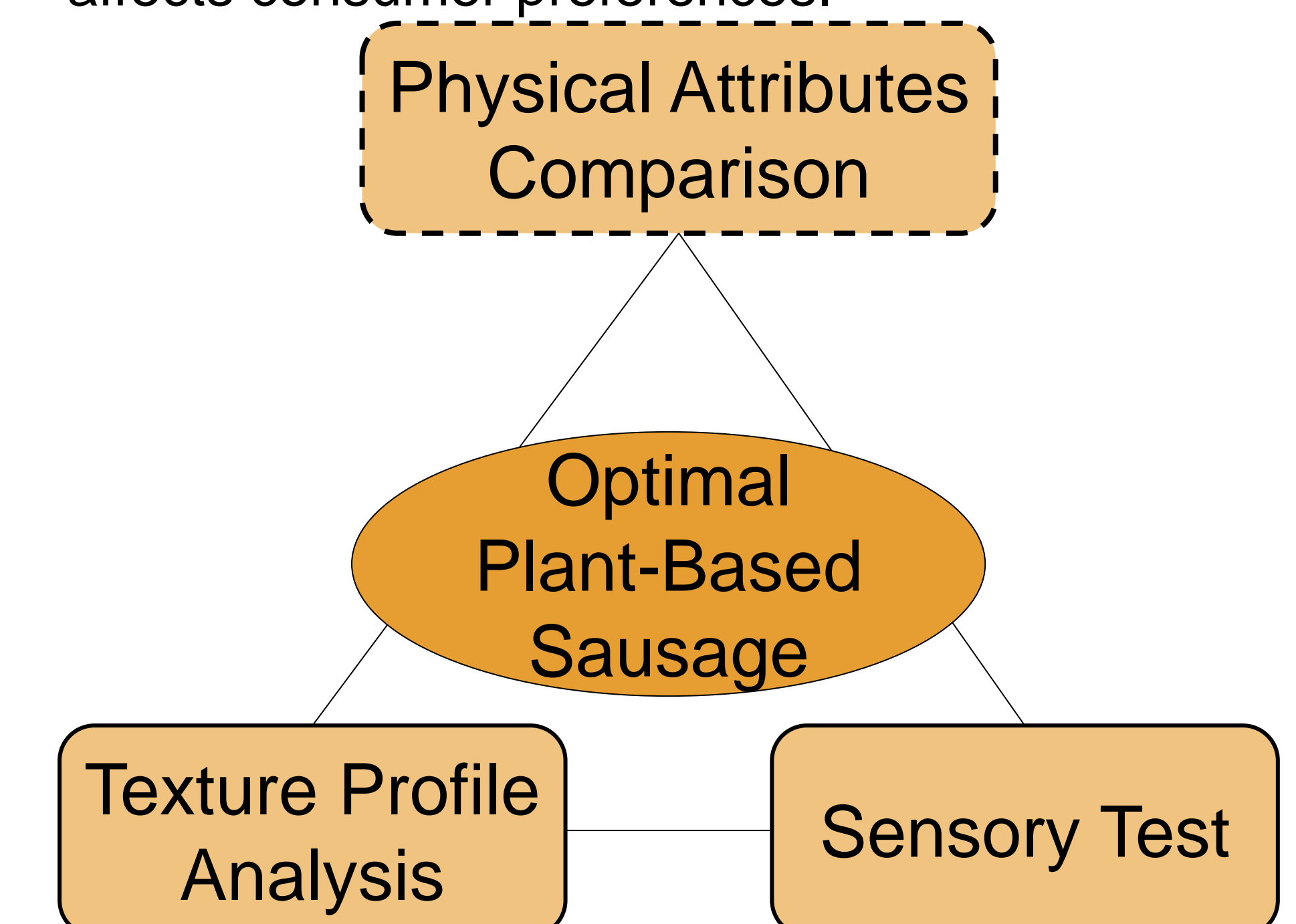


Figure 5. Three components that can guide the plant-based industry towards developing a plant-based sausage that closely mimics pork sausage.

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