Meat quality evaluation laboratory

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Meat and meat products provide the highest quality protein in the human diet. The increasing demand for meat—both in terms of quality and quantity—coupled with the need to feed a growing population, has led regulatory agencies to impose stringent guidelines on meat quality and safety. Consequently, objective and accurate rapid detection methods and evaluation techniques have become research hotspots in recent years.

Meat, including poultry, pork, and lamb, is a primary source of protein and offers significant physiological benefits. As meat consumption rises globally and in India, the importance of quality in consumer purchase decisions grows. Research indicates that meat quality is a key factor influencing consumer choices.

Meat quality assessments generally involve two major methods: subjective and objective. Subjective methods rely on sensory evaluations, including visual and tasting experiences. However, these methods are highly dependent on the evaluator's experience, offer poor repeatability, and are difficult to quantify. In contrast, objective methods traditionally involve laboratory tests that assess the physical and chemical properties of meat and identify microorganisms present.

At the ICAR-NMRI Meat Quality Laboratory, the focus is on studying the quality aspects of meat and meat products. The lab is equipped with modern tools and techniques to evaluate various factors, including composition, palatability (appearance, juiciness, tenderness, and flavor), water-holding capacity, muscle fiber size, meat pigments, consumer perception, texture, and tenderness. Quality variations in different meats and meat products are assessed using instrumental and chemical methods. Subjective evaluation through sensory testing is also employed to validate these instrumental and chemical methods.

The laboratory is involved in developing rapid evaluation methods and utilizing sensors and IoT-based tools to determine meat quality. Additionally, it supports small and medium-scale entrepreneurs, poultry breeders, and meat processors by developing new meat products for the market.

Research projects

1. *Technological and marketing interventions (online/e-commerce) to augment processing and consumption of traditional/indigenous meat products*
2. *Evaluation of non-thermal food processing technologies for extending the quality, shelf-life and safety of meat and meat products*

3. *Smart sensors for Packaged meat quality determination through IoT based reader (ICAR-NMRI-University of Hyderabad-Elvikon Pvt. Ltd project).*
4. Capacity Building for Clean Meat Production in Pune Municipal Commission region.*ICAR-NMRI and PMC-Pune collaborative project)*

Major equipment and facilities

1. Tetrameter to measure the tenderness and texture profile analysis ofmeat and meat products
2. Colorimeter to measure the colour properties objectively.
3. Facilities to evaluate the meat quality characteristics, new products development .
4. Solar dryer, other general laboratory equipment