

FLAVOR

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- Flavour is a complex sensation. It involves sensations from taste, smell and less defined from pressure sensitive areas of the mouth
- Uncooked meat has little odor and bloodlike taste. It is only when cooked does the true flavor come out.
- Recent studies using aroma volatile compounds have improved understanding of flavor but without the contribution from the polar soluble compounds in juices the full understanding of flavor is not complete

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- Fullness and satisfying feel of juices in the mouth plays a great role in appreciation of flavor

Factors affecting flavor

- *Species*. Muscle proteins are similar and perform similar biochemical functions. Differences in composition is very small.
- If one cooked lean meat from lamb, pork and beef there is no species flavor differences noticed

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- If one cooked fat tissue from lamb, pork and beef, typical species flavor become evident.
- GLC chromatograms from volatiles drawn from cooking fat tissue of these three species yields identical peaks and no single peak can be attributed to be responsible for the typical species flavor
- Fat acts a depot for flavor compounds

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- *Age.* Typical flavor increases until maturity. Calves of 6 months do not have the same flavor intensity like mature bulls at 12 months.
- *Breed.* Few reports have shown differences in flavor of dairy and beef breeds. The difference is in intensity than lack of flavor
- *Sex.* In the meat industry, objection to entire males for meat is not founded except in pork.

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- Entire males have a better FCE, more lean to fat ratio and meats with meat cuts with less fat.
- Pork from males used for breeding have a characteristic objectionable off flavor called *boar taint*
- This is as a result of accumulation of 5α androst-16-en-3-one (androstenone compound) in the fat
- At 6 months, 1ug/g or 1ppm is found in fat of such animals and can be detected while cooking

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- *Diet.* Feed contains naturally occurring odoriferous compounds that contain hetero atoms of sulphur, oxygen or nitrogen.
- They are unsaturated but get modified by rumenal dehydrogenation and are deposited in the aft as saturated compounds.

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- Diet before slaughter could affect flavor. Animals feed on Lucerne the flavor due to Lucerne could be detected by trained taste panelists.
- Use of protected feed supplements could alter the flavor. Compounds like linoleic acid protected in feeds by formaldehyde treatment confer the meat fishy flavor.

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- *Degree of fatness.* Good fat cover and high degree of marbling are not indicative or a guarantee of good flavor.
- Meat of different degree of fatness have no flavor differences in rating except in flavor intensity
- Fat is essential for flavor and there is sufficient fat in the lean for development of normal species flavor

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- *pH effects.* Meat of high pH like DCB has lower favor intensity than meat of normal pH
- *Storage.* Meat stored at chill temperatures of 0-4°C (conditioning) has increased favor intensity compared to meat that is not conditioned. Conditioning increases the release of volatiles(alkanes, pryazines, pyridines, benzonoids, pyrolles and furans) which are flavor precursors

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- Frozen storage. Shelf life of frozen meats is determined by organoleptic changes. These are mainly chemical and not microbial
- These are due to development of oxidative rancidity. Pork, veal are more susceptible than beef.
- Attempts to prolong shelf life in beef has been attempted by feeding vit. E protected supplements before slaughter. Vit. E is a potent antioxidant

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- *Cooking Method.* Method greatly influences final flavor. Microwave cooking only releases one third of the volatiles released during boiling.

Off flavors

- *Storage.* There is loss of volatiles during storage. At -30°C faint diacetyl odor is witnessed

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- Sex odors. Review case of boar taint as an off odor
- Feed. Taints from feed prior to slaughter are detectable by panelists. Cattle fed on pastures sprayed with dieldrin give a taint while those feeding on ragweed and have deficiency in tryptohan metabolism have skatole taint

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- *Environment.* Meat kept in vicinity of chemicals such as oils, paints absorb these and are detected when cooked
- *Metabolic deficiency.* Animals unable to excrete ketone and uremia get tainted with these.
- *Management.* Use of chemical insecticides and drugs prior to slaughter without observing withdraw period can result in taints

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- *Heating.* Cooking liberates H_2S which reacts with mesityl oxide to give the meat a catty odor
- *Irradiated foods.* Irradiation liberates H_2S mercaptans and carbonyls which give meat a bitter stale taste.

Purpose

- Understand factors that affect meat flavor and off flavors
- References
- Meat science 4th edition by Lawrie
- Principles of meat science by Forrest et al
- R.L.S Patterson "Meat flavor" *in* Meat edited by Cole and Lawrie **TS 1955 .E5 1974**