

# FOOD FILES

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## Trust matters: how confidence in science and technology drives consumer acceptance of cultivated meat

Cultivated meat, produced by growing animal cells rather than raising and slaughtering animals, offers significant environmental and ethical advantages. However, consumer acceptance remains uncertain. This study explored the role of trust in shaping attitudes toward cultivated meat among Australian adults and examined how perceptions of benefits and risks mediate this relationship. The findings reveal that trust is not a single concept but consists of distinct domains, each influencing acceptance differently. Trust in technology oversight emerged as the strongest predictor of willingness to buy cultivated meat, followed by epistemic trust in the science behind the technology. Institutional trust in authorities also played a role, but only indirectly through its effect on perceived benefits. Interpersonal trust, in contrast, showed little influence on acceptance.

Perceived benefits, such as environmental sustainability and animal welfare, were more powerful drivers of acceptance than reducing perceived risks. Younger consumers and those living in urban areas were significantly more open to cultivated meat compared to older adults and rural residents, suggesting that demographic factors will shape early adoption.

For the food industry, these findings underscore the importance of strategic communication. Building consumer trust requires

more than general reassurance; it demands transparency about safety standards, regulatory oversight and the scientific basis of the technology. Marketing should focus on highlighting the societal and environmental benefits of cultivated meat rather than concentrating solely on risk mitigation. Educational campaigns that explain how the technology works in clear, accessible language can strengthen epistemic trust and reduce perceptions of risk. Partnerships with credible institutions, such as universities and health authorities, can further enhance trust and legitimacy.

Industry should also consider targeted approaches for different consumer segments. Younger, urban consumers are likely to be early adopters and may respond well to messages emphasising innovation and sustainability. Older consumers may require reassurance about safety and regulatory compliance to overcome scepticism. Overall, the study suggests that increasing perceived benefits and reinforcing trust in technology oversight will be the most effective strategies for improving acceptance of cultivated meat in Australia.

Source: Harrison, P., & Liem, D. G. (2025). Consumer trust facilitates acceptance of cultivated meat. *Food Quality and Preference*, 136, 105733. <https://doi.org/10.1016/j.foodqual.2025.105733>

## Raw, golden or black? How garlic type changes the aroma, flavour and consumer acceptance

Garlic rice is a simple comfort dish, but the choice of garlic – raw, golden or black – can change its

aroma and consumer enjoyment. A study compared the volatile aroma compounds of the three garlic types and then evaluated consumer acceptance of garlic rice prepared with varying garlic levels and rice bran oil.

Using solid-phase microextraction coupled with gas chromatography-mass spectrometry, the study identified 26, 20 and 32 volatile compounds in raw, golden and black garlic, respectively. Raw garlic showed a strong presence of pungent sulfur-containing volatiles such as diallyl disulfide, while golden and especially black garlic developed additional compounds formed during thermal processing and Maillard reactions, including furan derivatives and organic acids that contribute sweet, roasted and fruity aromas. When incorporated into garlic rice, only a subset of these sulfur compounds carried through, with diallyl disulfide consistently present at higher levels in rice made with raw garlic, particularly when higher garlic and oil levels were used.

Consumer testing with 88 participants across 13 garlic rice samples showed that garlic type and amount were the key drivers of overall liking. Samples containing 8% raw garlic received the highest overall liking scores and the strongest purchase intent. In contrast, samples prepared with golden and black garlic had a milder garlic flavour and lower acceptance. Sensory analysis suggested that using more than 8% golden or black garlic may be necessary to improve flavour intensity and increase consumer acceptance.

Together, these findings highlight the importance of selecting both the appropriate garlic type and quantity to achieve desirable garlic flavour and maximise consumer acceptance in garlic rice products.

Source: Pakakaew, P., Dias, D. A., Lewin, S., Nolvachai, Y., Utama-Ang, N., & Keast, R. S. (2025). Volatile profiles of raw, golden, and black garlic and their sensory impact in garlic rice. *Journal of the Science of Food and Agriculture*, 10. <https://doi.org/10.1002/jsfa.70309>

### **What's that smell? Sensomics-based characterisation of off-flavour compounds in reheated roasted catfish**

Channel catfish is a high-quality freshwater species well suited for commercial processing. Its meat is flavorful, rich in lipids and essential nutrients, characterised by a distinctive taste, and free from intermuscular bones. Currently, channel catfish is commonly processed into products such as frozen fillets, catfish balls, and ready-to-heat (RTH) roasted catfish. The RTH roasted form is a semi-finished product produced through a series of pretreatment steps, including open-back curing, roasting, and rapid freezing, enabling convenient consumption after simple reheating. Owing to this convenience, together with its consistent flavour and high nutritional value, the product has gained substantial consumer acceptance. However, during reheating, roasted catfish frequently develops an undesirable “off-flavour” which includes fishy notes and “warmed-over flavours.” The emergence of these off-flavours markedly diminishes the product’s sensory appeal and presents a key challenge to the further growth of the prepared food industry.

Zhou et al. applied gas chromatography–electronic nose (GC-E-nose), gas chromatography–ion mobility spectrometry (GC-IMS), and gas chromatography–olfactometry–mass spectrometry (GC-O-MS), combined with odour recombination and omission assays to characterise the off-flavours that developed in commercially available

RTH roasted catfish following reheating.

The authors found that after reheating, the RTH roasted catfish developed a pronounced off-flavour, primarily characterised by fatty, grassy, hard-boiled egg, metallic, and fishy notes. Through a sensomics-based analysis, key off-flavour compounds were identified, including hexanal, heptanal, (*E*)-2-hexenal, octanal, 3-methyl-1-butanol, 1-octen-3-ol, and (*E,E*)-2,4-heptadienal. The authors stated that these compounds, largely derived from lipid oxidation, may serve as potential markers of off-flavour formation in reheated RTH roasted catfish, and compounds such as sulfides, allyl methyl, D-limonene and linalool may act as potential masking agents, modulating the perception of undesirable aromas. Consequently, the increase in lipid oxidation products, protein degradation, and the introduction of exogenous aroma spices, along with their interactions, may significantly contribute to off-flavour formation. The authors concluded that further research is required to clarify the underlying mechanisms of off-flavour formation, as well as the strategic use of masking agents to improve the overall flavour quality of prepared fish products.

Reference: Zhou M, et al. (2025). Characterization of off-flavor compounds in ready-to-heat roasted catfish after reheating by sensomics approach. *Food Chemistry X*: 30, 102872.

### **Omics labelling may shape consumer perceptions of fresh produce**

Omics technologies (eg., genomics and metabolomics) are emerging as tools to verify a product’s origin, including whether it is truly organic. It works by identifying unique biomarkers to verify the traceability and authenticity of a product. This technology can be costly, and there is a need to understand if there is a benefit to consumer perceptions from this kind of certification. A recent study by a research group in Italy explored this, using apples.

Researchers recruited 129 consumers to evaluate identically

sourced apples presented under three different labels: conventional, organic, and omics-certified. Explanations of each label were also presented so consumers were aware of what omics-certified meant. Participants rated each apple on visual appeal, liking of taste and purchase intent.

There were no statistically significant differences in how people rated the look or taste of any of the apples. In other words, knowing an apple was omics-certified didn’t make it taste or look better (or worse). However, both omics-certified and organic apples scored significantly higher in purchase intent than conventional apples. This suggests that while the omics label didn’t change sensory expectations, it did improve consumers’ willingness to buy.

These results suggest that omics certification may be as effective as traditional organic labels, especially for consumers who value authenticity and traceability. Further research is needed to see if companies can leverage omics-based traceability to build trust with consumers and differentiate products in the marketplace.

Source: Castellini, G., et al. (2025). Omics labeling and consumer preferences: understanding aesthetic and taste evaluations in apple purchases. *Food Quality and Preference*, 105574. <https://doi.org/10.1016/j.foodqual.2025.105574>

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