

How to improve sensory quality

in chicken meat, dairy products, and beef meat

INTAQT partners assessed the sensory characteristics of milk, beef loin, and chicken breast and thigh meat collected from 81, 55, and 91 European farms, respectively, representing different levels of production intensification. Farming systems were classified according to factors such as genotype, growth rate, outdoor access, feeding practices, stocking density and slaughter age.

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In **chicken meat**, meat from fast-growing birds was generally perceived as more tender and less fibrous, while slower-growing birds produced meat with a firmer texture and more distinctive flavours. Consumer liking differed among production systems, with preferences varying across countries.

In **dairy products**, the main sensory differences were associated with feeding practices, particularly the use of fresh or preserved grass, which influenced milk colour and the sensory profiles of UHT milk and Parmigiano Reggiano PDO cheese.

In **beef meat**, quality indicators differed among farming systems, but consumer eating quality showed no consistent relationship with intensification.

Overall, no single farming system consistently maximised all quality traits. Improvement strategies should therefore focus on specific farming practices and their alignment with consumer expectations

Sensory quality of chicken breast and thigh meat

Chicken meat was investigated within a network of 91 European farms representing different levels of production intensification. Farm typologies were defined according to outdoor access, genetic growth potential and slaughter weight. Sensory characteristics of breast and thigh meat were assessed by trained panels, while consumer tests examined liking of ready-to-eat breast products.

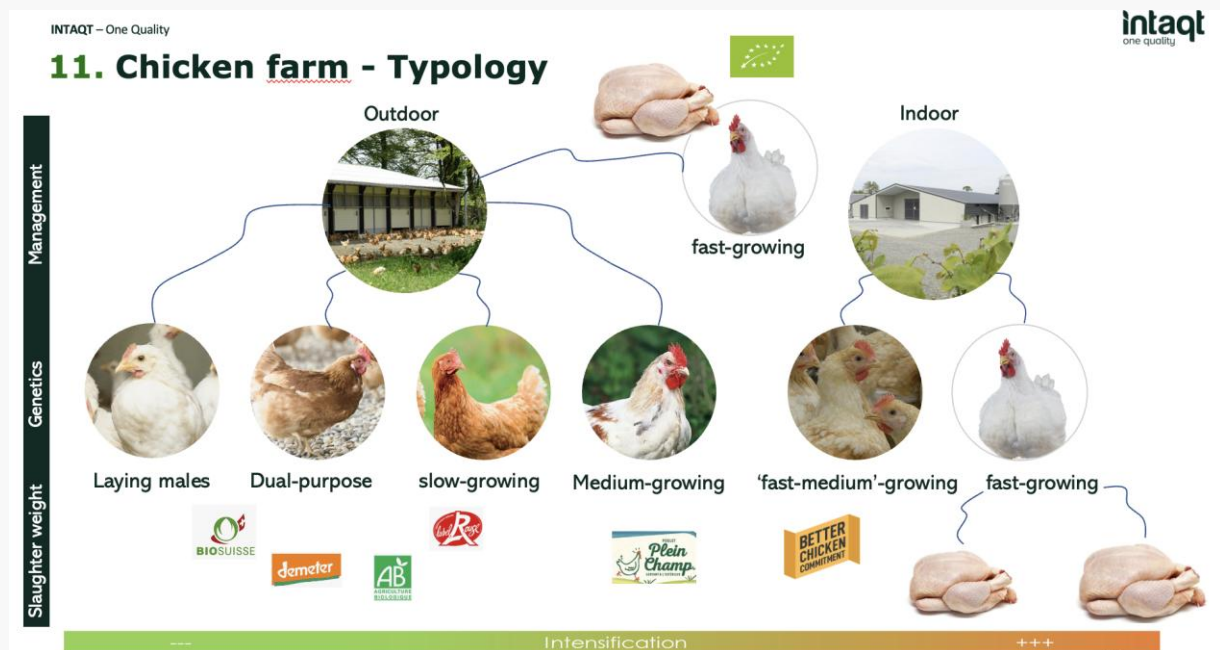


Fig. 1: Typology of chicken farms along a gradient of intensification

Trained-panel assessments revealed mainly textural differences. Meat from younger, fast-growing chickens was generally more tender and less fibrous than that from older, slower-growing birds, in both breast and thigh. Juiciness differed among systems only in thigh meat, while flavour differences were less consistent. In the Italian consumer test, overall liking of ready-to-eat breast ranged from 5.72 (outdoor slow-growing) to 6.98 (indoor fast-growing, heavy birds) (Fig. 2). Significant differences were found for aroma, taste, texture and overall liking, but not visual liking. Differences were smaller in France, suggesting market-dependent preferences. Overall, growth rate and slaughter age were more closely associated with sensory quality than intensification alone, without necessarily determining consumer preference across markets.

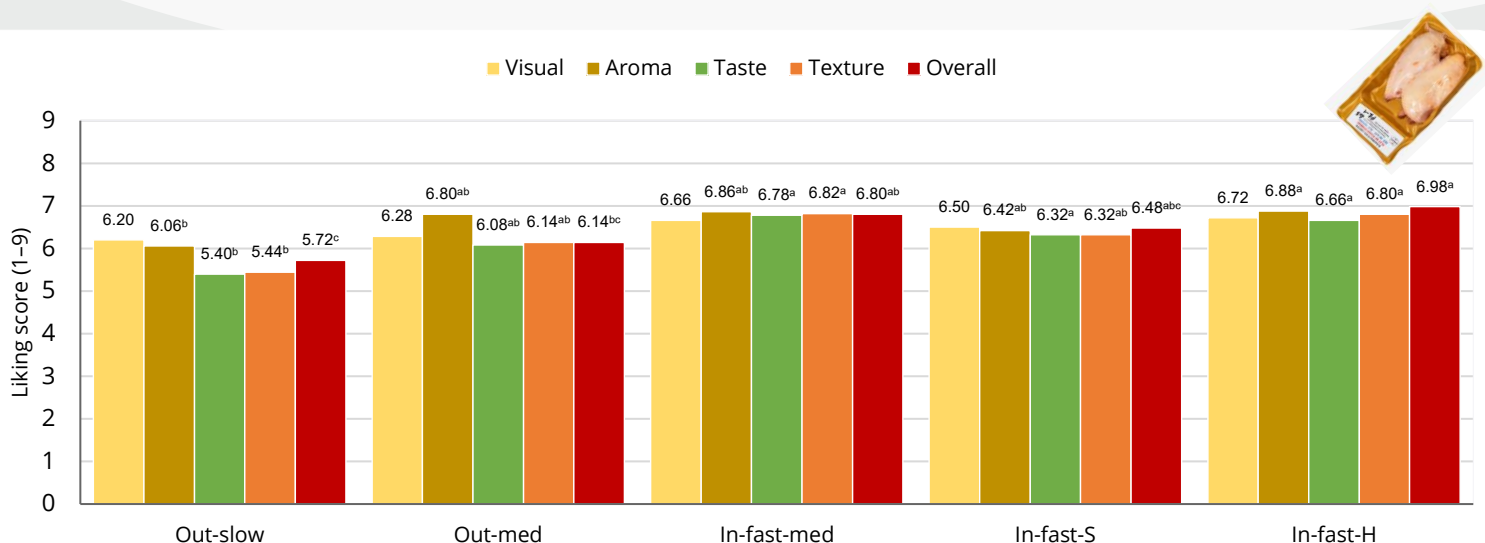


Fig. 2: Consumer liking of ready-to-eat chicken breast according to production system (Italian consumer test)

Sensory quality of dairy products

A total of 394 bulk-tank milk samples were collected over approximately two years from 81 dairy farms in France, Italy, Switzerland, Germany and Ireland, covering both summer grazing and winter indoor seasons.

Farms were classified along an intensification gradient based on animal feeding inputs (concentrates and maize silage) and inputs for feed crop production (fertilizers and pesticides) (Fig. 3). Milk from grass-based systems showed a more yellow colour, which persisted after UHT processing.

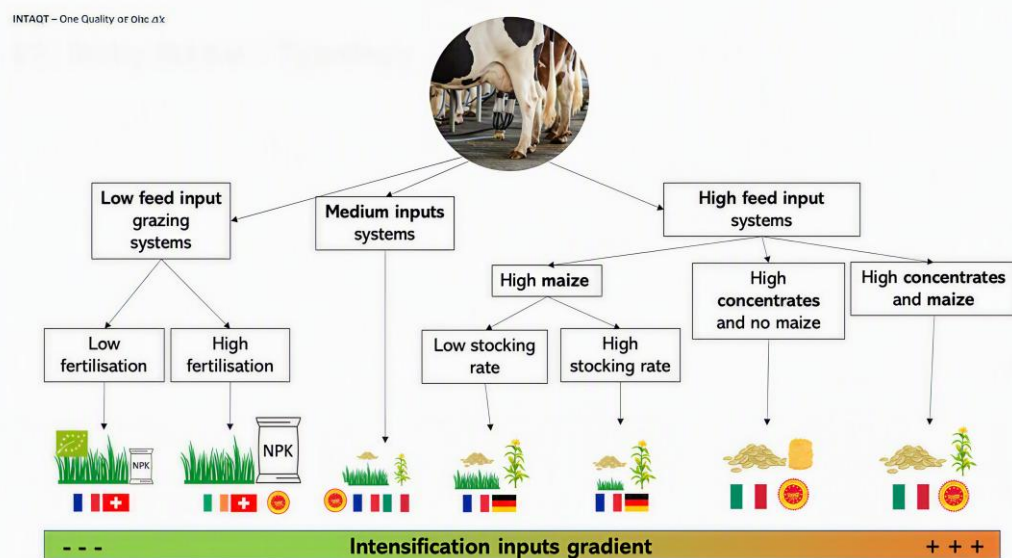


Fig. 3: Typology of dairy farms along a gradient of intensification

Consumer tests revealed lower taste liking for UHT milk from low-input farms (6.29) compared with medium- and high-input systems (6.80), and for spring (6.45) compared with winter milk (6.81) (Fig. 4). No significant differences in liking were observed between Italian and French consumers.

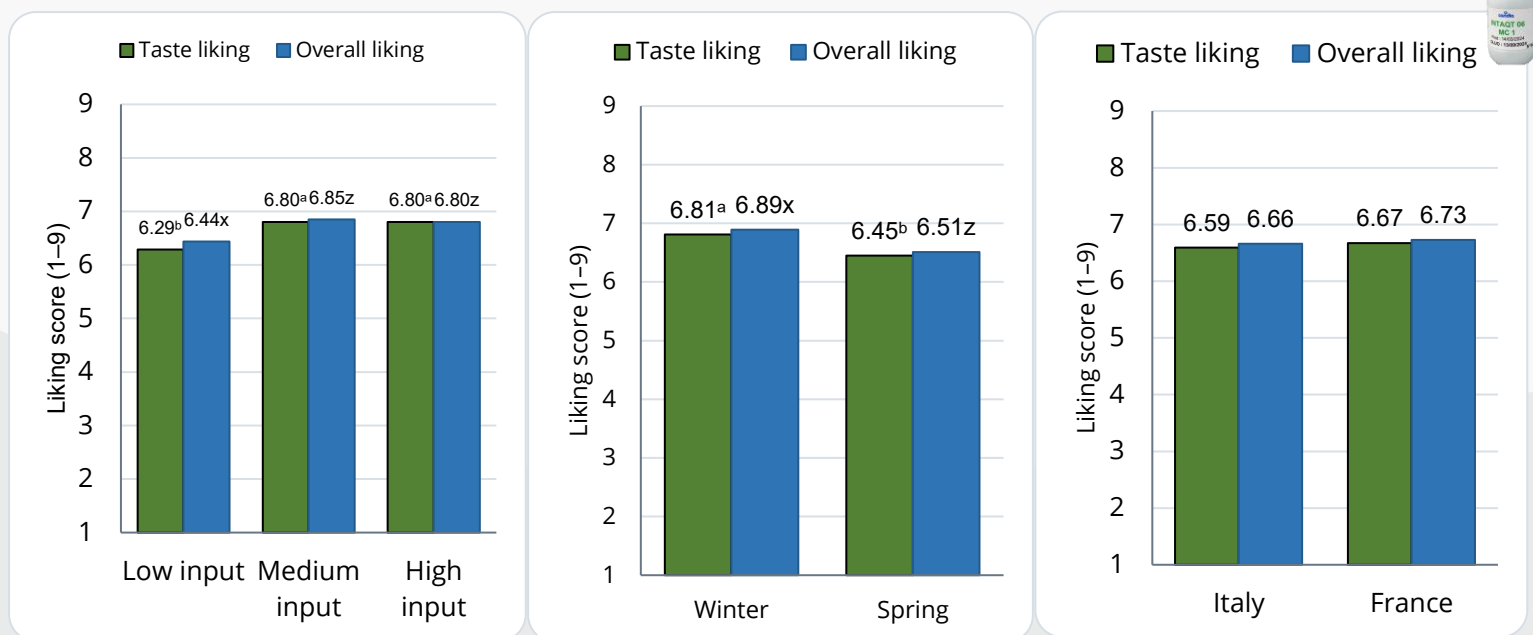


Fig. 4: Consumer liking of UHT milk according to farm input level, production season and country

Fresh-grass feeding influenced cheese sensory characteristics, producing a yellower colour, a more melting texture and stronger flavours, even when replacing only one-third of dietary hay. However, Italian consumers showed no overall preference between treatments, with liking influenced by expectations of colour and texture.

Overall, feeding practices and season contributed to dairy sensory distinctiveness, without necessarily improving consumer liking.

Sensory quality of beef

Beef eating quality was assessed in 200 animals from 55 farms in France, Switzerland, Italy, Spain and the UK, representing six farming typologies differing in animal category, grazing practices and feeding inputs (Fig. 5). Blind consumer tests were conducted in France, Italy and Poland to evaluate tenderness, juiciness, flavour and overall liking of aged striploins.

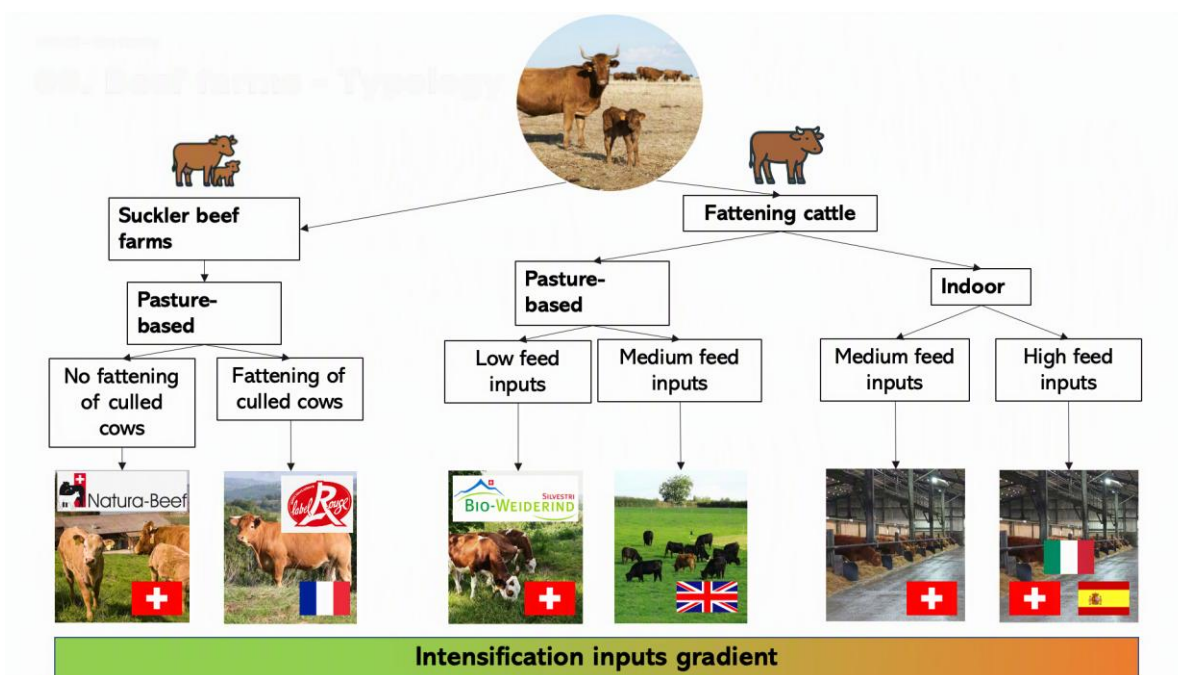


Fig. 5: Typology of beef farms along a gradient of intensification

Although consumer eating-quality scores (MQ4) differed among farming systems, no consistent relationship with intensification was observed (Fig. 6). Within-system variability was four to five times greater than differences between system means, indicating that farming-system classification alone is a poor predictor of eating quality. In a comparison of 38 striploins evaluated in two countries each, Polish consumers generally gave higher scores than French and Italian consumers.

Nevertheless, sample rankings remained broadly consistent across countries ($r = 0.67$).

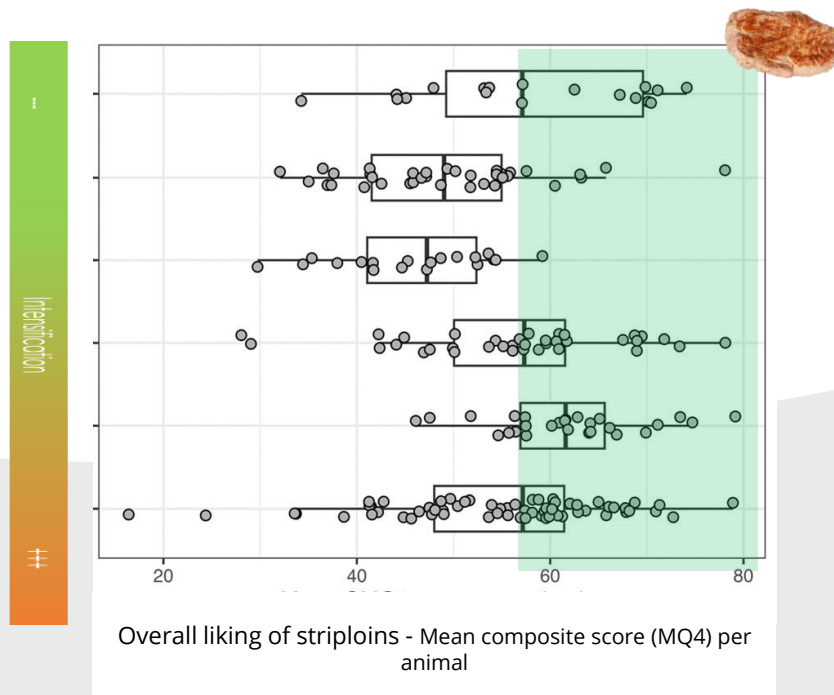


Fig. 6. Distribution of consumer eating-quality scores (MQ4) for beef striploins from different farming

Overall, farming-system intensification alone did not determine beef sensory quality. The substantial within-system variability highlights opportunities to improve eating-quality consistency through animal selection and post-mortem management.