

Single Attribute List, Guide to Terminology

Created by members of the subcommittee responsible for the ACS CCSE Exam, 2025

This list of aromas was compiled to represent a range of different possible aroma types used in the descriptive sensory analysis of cheese. This is certainly not a complete list of individual aromas or compounds; there are thousands of possible aroma compounds that are present in milk and dairy products or that form during processing or ripening. These aroma notes are best thought of as list of aroma *categories* because many individual compounds may be described using these terms; the singular descriptors, i.e., *grassy*, *hay*, *banana*, are naturally occurring composites of a diversity of individual compounds, some of which have been documented to occur in dairy products.

Part of the consideration for inclusion on the list is the commercial availability of corresponding ‘Flavor Standards’ or prepared aroma concentrates that are safe for smelling and tasting, generally used to train sensory panelists to detect a certain aroma type at varying concentrations. An effort was made to focus on aromas with Flavor Standards that were more commonly detected in studies of cheese than other available standards. So the Flavor Standards that may be used to spike milk with aroma for evaluation during the exam are meant to serve as good examples of the corresponding aroma type. We are providing, as part of this document, a list of the Flavor Standard compounds, if known, along with a common aroma reference, and a fuller description of what the reference compounds smells like.

An effort was made to organize the list into categories. This is a difficult task, due to the complex nature of aroma compounds. According to flavor chemist Dr. Arielle Johnson, *“Many industries where smell is important, like wine and perfume, have developed lexicons or categories for those they need to talk about the most—but there’s no decisive, universal breakdown like there is for taste. [Sweet Salty, Sour, Bitter, Umami] Smells are irreducibly multifaceted, contain many molecules mixing their signals together, and have a seemingly endless elasticity to accommodate unique sensations. When you smell almost any ingredient you could think of—a quince, a piece of cheese—the perception your brain builds for you is a holistic unit of smell, overlaid with some (but not all) of the distinguishable aroma notes of its individual component molecules.”* (Flavorama, 2025)

With this wisdom in mind, a system of organization was implemented that uses both common aroma types ‘fruity, floral, dairy’ and chemical classifications that typify some of the different expression types those categories—fruity esters versus fruity lactones versus a dairy lactone note. The chemistry classification points to the structural style of a compound, but these categories are notoriously diverse in their expression; one can find different aldehydes with fruity, vegetal, meaty, or grassy qualities, for instance. So an effort was made to present a simplified landscape of these relationships that reflects common expressions of cheese attributes to serve as an entry point for learning about the complex world of flavor chemistry.

This work is aspirational—as our industry develops a lexicon to describe cheese aroma in greater detail, we are positioning ourselves to communicate more productively about cheese attributes. This communication can help those that develop cheeses to make connections between the types of chemical reactions that occur when fats, proteins, and residual sugars are broken down through microbial enzymatic activity during ripening. On a pragmatic level, a supply chain that uses a uniform set of descriptive vocabulary is one that better describes the merits of a cheese down the supply chain and better diagnoses an issue with a cheese back up the supply chain. We appreciate the willingness of test takers to engage with this ongoing process as we develop more dynamic descriptive analysis tools for our industry.