

International Perspectives

Developing Common Methods for Characterizing Cheese

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Part 1 of 3

Cheeses are finding people's mouths for many reasons; someone is just stuffing himself with anonymous barrels of anonymous cheese, while a lot of people are heating cheese in sandwiches or, cheese alone with/without bread or, cheese as an ingredient for cooking specialties.

While some people are eating cheeses for learning their tastes, aromas

and flavors in a hedonistic or critical way, few people are skilled at grading cheese and ranking it during official evaluations for cheese trade or cheese contests.

Less than a few are skilled and practicing the job of panelist for cheese sensorial analysis.

Listing these five levels of cheese descriptions, wording, appreciations/depreciations, we are putting ourself in a sort of "Cheese Babylon".

Here we talk about a professional approach for tasting cheeses and trying to put some order in the word's meaning. In fact, when I started my cheese tasting walk in Italy, I found

a lot of confusion on it.

For instance, Slow Food was promoting a hedonistic approach more based on rhetorical wording to describe cheeses: scents, perfumes or, fragrances instead of odors; feeling or shading and emotions instead of tastes and flavors.

The goal was quite perfect, to promote cheese tasting but, the wording was equivocal and ambiguous, totally useless for professional purposes.

Another Italian organization ONAF-CTNO (Organizzazione Nazionale Assaggiatori Formaggi - Cheese Tasting National Organisation) started the activities teaching a method for giving points to cheese sam-

ples and, after many years, went back to get a better beginning understanding by starting with an objective description.

Later when the course's participants learned all cheese characteristics, the New Cheese Taster could give his own descriptions. In short form: learning and describing before grading.

Good results are coming now and we are ready (as ONAF-CTNO), after the first level (Cheese Taster) and the second level (Cheese Taster Master) to start with a third level of skills (Professional Cheese Taster) in the near future.

Everybody agrees that talking

about cheese description is a matter of harmonized wording.

In this regard useful to me is the excellent work of a group of researchers, responsible for cheese sensory analysis, formed to ensure uniformity and to develop a common method for characterizing hard and semi-hard cheeses, like Comté, Parmigiano Reggiano, Fontina, Mahòn and Appenzell, respectively from France, Italy, Spain and Switzerland, and all Protected Designation of Origin cheeses (within the FLAIR - COST 902).

The original version of this study was published in *Food Science & Technology* 26, 59-68, 1993; and it has been established that the initial factor in the cheese evaluation is its physical aspect, while the second is the texture and finally its flavors.

The group of researchers agreed on the means to evaluate cheese texture as no method was directly applicable and they decided to adopt the criteria of "reference products" market accessible.

The mechanical characteristics were determined by physical and sensory definitions as well as by an original assessment technique. The magnitude of the perception was

measured on a scale of seven gradations, three of which are fixed by a standard reference product available in all European countries.

In a second step (AIR-CT94-2039 published in 1997) the same group of researchers developed a common methodology to characterize odors, tastes, flavors and trigeminal sensations.

Odors and flavors were classified into smells and aroma families and a "Cheese Aroma Wheel" (see diagram) was proposed by Florence Bèrodier, Pierre Lavancy, Mario Zannoni, Jeronima Casals, Louis Herrero, Corrado Adamo.

Smell and Aroma Family

The eight families of Smell/Aroma are: Lactic, Vegetable, Floral, Fruity, Toasted, Animal, Spiced, Others.

The sub-family of Lactic aroma includes: Fresh lactic, Heated lactic, Acidified lactic, Cheese rind; furthermore, Fresh lactic can be diversified in smell descriptors as: Fresh milk, Fresh curd, Fresh cream, Fresh butter. And so on for all family from intern to extern: 29 smell sub-families for 75 smell descriptors.

In total, during the two-step research, more than 30 sensorial descriptors were harmonized, and their technical evaluations were defined.

The next article will give the sensorial definitions of the 14 most used descriptors. •



Stoelting, MSS Announce Marketing Alliance

Kiel, WI—Stoelting's Process Equipment Division and MSS this week announced the formation of a strategic marketing alliance.

The alliance will expand the Stoelting product offering and overall systems capabilities, according to the announcement. For MSS, the alliance provides increased sales presence in the marketplace through the reach of the Stoelting sales team.

Established in 1905, Stoelting LLC, Kiel, WI, is a diversified manufacturer of cheesemaking and other

equipment. The company's Process Equipment Division designs and manufactures cheese and food processing equipment.

MSS, Integrated Process Technology, of Wisconsin Rapids, WI, manufactures membrane systems for the dairy and food industries. Known for On-Farm™ Milk Concentration, Mem-Brine®, and Micro-Steel® Caustic Recovery, MSS is also equipped to handle UF, RO, NF, and MF system needs.

MSS, which is celebrating 20 years in business this year. International presence includes agents in Poland and a joint venture in India. •

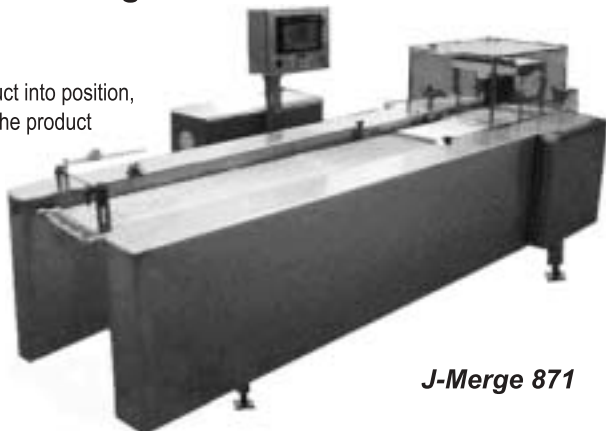
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International Perspectives

Developing Common Methods for Characterizing Cheese

Part 2 of 3

The previous article, published June 10 (see www.cheesereporter.com/guested.htm) introduced these arguments driven to move on from art to science the cheese tasting wording as proposed by a European group of sensory analyst working daily with PDO cheeses like Comté, Parmigiano Reggiano, Fontina, Mahòn and Appenzell. They are the following researchers: C. Adamo, F. Berodier, J. Casals, L. Herrero P. Lavanchy, Y. Noel, J. Squella, M. Zannoni.

Practicing the sensory assessment based on the above scientific works we should start by visualizing the sample, touching it, smelling and biting-deforming and reducing the cheese to a bolus before swallowing.

A harmonized comparison chart for evaluating colors and eyes is still an objective to be reached. Now we move on to the 14 most useful descriptors to characterize all cheese of the world.

1-Smell (Odor). Sensory definition: organoleptic attribute perceptible by the olfactory organ on sniffing certain volatile substances. AFNOR: Intensity of odor: the strength of stimulation perceived over the cheese stick, evaluated either when approaching the nose, or when broken in two very close to the nose.

Smell identification: should be done recalling in the memory respecting the following order: smell family, smell sub family, smell descriptor.

2-Aroma. Sensory definition: organoleptic attribute perceptible by the olfactory organ via the back of the nose when tasting. AFNOR: Intensity of aroma: the strength of the global stimulation perceived at olfactory bulb level. This stimulation is brought about by the aromatic cloud freed by chewing and guided towards the interior or the nose

breathing.

Taste: Sensory definition: a sensation perceived by the gustative organ -the tongue- as soon as it is stimulated by certain soluble substances-AFNOR-.

3-Sweet taste. Sensory definition: qualify the primary taste produced by aqueous solutions of various substances such as sucrose or fructose-AFNOR-.

4-Salty taste. Sensory definition: describes the primary taste produced by aqueous solutions of various substances such as sodium chloride -AFNOR-.

5-Acid taste. Sensory definition: describes the primary taste produced by diluted aqueous solutions of most acid substances such as citric acid, tartaric acid, lactic acid -AFNOR-.

6-Bitter taste. Sensory definition: describes the primary taste produced by diluted aqueous solutions of various substances such as quinine and caffeine -AFNOR-.

Trigeminal sensations. Sensory definition: Trigeminal sensations are oral sensations including irritating and/or aggressive sensations perceived in the mouth or in the throat-AFNOR-.

7-Pungent (Piquant). Sensory definition: describes the sensation which manifests itself in the mouth by itching which could even lead to pain (fine needles). This sensation is felt all over the mouth including the palate and the tongue and is often felt with pepper, fresh radish and horseradish.

8-Astringent. Sensory definition: describes the complex sensation accompanied by shrinking, drawing or puckering of the skin or mucous surface in the mouth, produced for example, by persimmon tannins and sloe tannins or, red wine tannins -AFNOR-.

Other trigeminal sensations could be listed, such as hot, refreshing,

sour, metallic but are quite difficult to evaluate, needing skilled techniques.

Aftertaste. Sensory definition: olfactory and/or gustatory sensation which occurs after the elimination of the product, and which differs from the sensations perceived while the product was in the mouth-AFNOR-.

Overall Persistence. Sensory definition: persistence of an aroma and/or taste sensation similar or close to what was perceived when the product was in the mouth and whose persistence can be measured: short for 1-3 seconds, medium for 10-15 seconds, long for more than 30 seconds.

Aftertaste and overall persistence are not included in the final graph.

Mechanical characteristics. These characteristics are evaluated by small fingers of cheese measuring 1.5 cm to 1.5 cm in thickness and 5 to 8 cm long are usually cut in the direction in which cheese is compressed.

9-Elasticity. Physical definition: ability of a substance to recover its initial shape and dimension after being submitted to pressure.

Sensory definition: ability of a cheese sample to rapidly regain its initial thickness after compression and deformation.

10-Firmness. Physical definition: resistance to a given deformation.

Sensory definition: resistance of the sample to a very slight opening and shutting of the jaws.

11-Friability. Physical definition: characteristic of a substance which can be easily broken into pieces.

Sensory definition: capacity of a sample to break into numerous pieces from the beginning of the mastication.

12-Adhesivity. Physical definition: the effort involve in overcoming the forces which keep two surfaces in contact.

Sensory definition: the effort needed for the tongue to detach a product stuck to the palate and the teeth.

13-Solubility. Sensory definition: a sensation which emerges when the sample melts extremely fast in the saliva.

14-Humidity (impression of). Sensory definition: perception of the degree of humidity in the cheese sample.

Criteria of deformability, microstructure, melting, plastic, fibrous, squeaky, crunchy, tightly packed/compact, rubbery, floury, supple, lumpy, intrusive are defined but not so easily found in cheese samples.

The next article will give you some examples of practical applications of this wording. •

FROM OUR ARCHIVES

50 YEARS AGO

June 24, 1955: **Ithaca, NY**—Effective July 1, Robert F. Holland will become head of the dairy industry department at Cornell University, succeeding James M. Sherman who has been head for the past 32 years. Sherman is relinquishing his administrative duties but will continue on the staff of the College of Agriculture as professor of bacteriology.

New York—Bread Basket, Inc., manufacturers of Bageltime, the brand name selected for their vacuum-packed canned bagel product, have announced that they have enlarged production facilities and are now ready to expand general distribution beyond the metropolitan New York area.

25 YEARS AGO

June 20, 1980: **Washington**—Secretary of Agriculture Bob Bergland said he wants to change federal milk support programs to prevent a sharp increase in dairy prices this fall. Dairy men will get another automatic price increase this fall unless the rules of the milk subsidy are changed, Bergland noted.

Madison—Richard D. Groves, 1980 graduate of the University of Wisconsin-Madison with a major in agricultural journalism, has been made a staff member of The Cheese Reporter as editorial assistant. He has been working with The Cheese Reporter for the past two and a half years.

10 YEARS AGO

June 23, 1995: **Milwaukee, WI**—Foremost Farms and the Morning Glory Farms region of Associated Milk Producers, Inc. (AMPI), two of the Upper Midwest's largest dairy cooperatives, are considering a merger that could save more than \$10 million its first year, according to Robert Thompson, president of Morning Glory Farms.

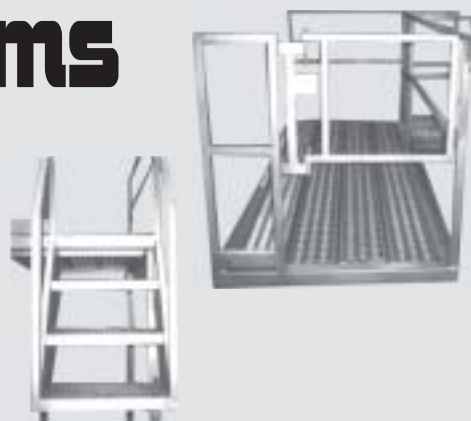
New York—The Coffee, Sugar & Cocoa Exchange, Inc.'s (CSCE) board of managers last week approved a comprehensive launch plan for the Exchange's milk futures contract, which is currently under review by the Commodity Futures Trading Commission. The launch plan includes two new programs: a Milk Permit Program (MPP) and a Registered Market Maker (RMM) program. MPP is designed to develop member support and foster initial liquidity in the market, said CSCE chairman Brian Kelly.

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by Vincenzo Bozzetti

Part 3 of 3: Visit www.cheesereporter.com for the other two parts of this series.

Describing cheese samples is always quite difficult or subjective. Using the wording published recently, we are becoming less subjective and more and more objective when it comes to cheese.

For this purpose we are using a scale with 5 degree: low and high having medium low, medium and medium high.

A quite simple and practical method, it was realized by V. Bozzetti, B. Morara and M. Zannoni, putting all 14 cheese descriptors around a small center for describing cheese samples.

People who had sensorial training could start using it, people who had not should have a course before grading cheese samples.

The model proposed is entitled to Etana, shepherd, cheese maker and King of Kish, city close to the Abraham's village, 2500 years B.C.

Visiting Madison, WI, some time ago, I got a chance to taste and describe some Wisconsin cheeses. Here are seven example of descriptions:

Sharp white Cheddar. More rich aroma (2) than smell (1) aroma family lactic; medium low acid taste, salty and bitter tastes (2), low sweet taste (1). Little astringent (1) but not pungent (0). Medium low elasticity (2) and medium firm (3). Adhesivity, solubility and humidity medium low (2), friability absent (0).

Aged white Cheddar. Smell medium low (2) with medium aroma lactic and vegetal (3). Less sweet, acid and bitter (1) than salty (2), Low elasticity (1), medium firm (3), Medium low adhesivity and humidity (2) with medium solubility (3).

Parmesan. Medium high smell (4) with medium aroma (3) lactic and toasted. More acid and salty (2) than sweet and bitter (1). Slightly astringent and pungent (1). Inelastic (0), medium firm (3). Slightly friable and adhesive (1), medium low solubility and humidity perception (2).

Romano. Very high smell (5) and, medium high aroma (4) toasted and butyric. Medium acid taste (3) prevailing on medium low salty and bitter taste (2). Slightly sweet (1), medium high pungent perception (4) in presence of medium low astringent sensation (2). Inelastic (0) with medium high firmness (4) and medium low friability (2). Low adhesivity and humidity (1) in presence of medium solubility (3).

Muenster. Medium smell (3) with medium low aroma (2) lactic and vegetal, the acid taste (2) is prevailing on the sweet, salty and bitter (1). The texture of the cheese is medium high elastic (4) with medium low firmness. More soluble (3) than humid (2).

Monterey Jack. Aroma (2) prevailing on the smell (1). Sweet and acid tastes (2) predominant on salty and bitter tastes (1). Medium low elasticity and firmness (2). The cheese had quite high adhesivity (4) and solubility (3). Medium low humidity (2).

Cottage Cheese. Medium low smell (2) prevalent on the lactic aroma of fresh butter (1). More sweet (3) than acid (2). No salty (0) neither bitter (0). The cheese texture is slightly adhesive (1) in presence of very high solubility (5) and humidity (5).

The above description could be a first step for cheese production sensorial checking, as it permits to identify the main descriptors for each type of cheese, for grading and assessing quantitatively the production constancy.

In this meaning some dozen of Italian dairies adopted the method.

I hope you have enjoyed this series on placing descriptions to cheese. Contact me if you have further questions.

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FROM OUR ARCHIVES

50 YEARS AGO

July 1, 1955: **Madison**—More than five cents could be cut from the cost of a quart of milk if housewives could take a pitcher to the dairy or store, according to a special committee on dairy price spreads.

Chicago—American cheese production in May was estimated by the Agricultural Marketing Service at 128,980,000 pounds, up 2 percent from a year earlier and up 14 percent from the five-year, 1949-53 average for May. This May's production was at the highest level for any month ever recorded.

25 YEARS AGO

June 27, 1980: **Madison**—Glenn M. Anderson, president of the Cooperative League of the US for the past two years in Washington, died this week following open heart surgery. A native of Redwood Falls, MN, Anderson headed the former Wisconsin Association of Cooperatives here and then became executive secretary of the Wisconsin Federation of Cooperatives, which was formed in 1969 with the merger of the association with the Wisconsin Council of Agriculture.

Rosemont, IL—The United Dairy Industry Association's board of directors recently approved plans for the biggest promotional campaign for cheese ever, pledging financial backing for the \$4 million dairy farmers will spend to advertise and promote cheese nationwide during the key fall sales period.

10 YEARS AGO


June 30, 1995: **Milwaukee, WI**—The board of directors of the Wisconsin Cheese Makers Association this week elected Ron Buholzer, president of Klondike Cheese Company, Monroe, WI, to a second term as WCMA president.

Washington—US Secretary of Agriculture Dan Glickman outlined USDA's views on dairy price support and federal milk marketing order issues this week. In general, Glickman said the 1995 farm bill should increase economic efficiency by making programs more market-oriented, protect dairy producers from undue financial stress without imposing new burdens on customers, and promote regional and international competition in dairy markets. The bill should also provide dairy producers appropriate incentives for environmentally beneficial practices.



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CHEESE REPORTER
 Vol. 129, No. 33 • Friday, February 18, 2005 • Madison, Wisconsin

US Dairy Imports Top \$2 Billion, Exports Hit \$1.48 Billion; Deficit Falls

January Milk Production Rises 1.5%; Three States Added to Monthly Production Estimates: 2004 Output Revised Up

USDA Sets Merit 7 Hearing On Deposing Supply Plant Standards; Other Issues In Midwest Order

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Dairy Processing: Improving Quality
 edited by Gerrit Smit, 546 pages, 2003
 This book reviews the range of new technologies such as on-line monitoring of milk quality; high pressure processing to extend shelf-life; production of powdered dairy products and the use of carbon dioxide. Parts of the book review the major constituents of milk. Also discussed developments in pasteurization and sterilization.

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