



Glossary of Terms for Cheesemakers

ABNORMAL MILK: Milk that is bloody, stringy, off colored, visibly abnormal, abnormal in odor, or abnormal in any other respect. Colostrum milk is considered abnormal milk.

ACETIC ACID: The main type of acid found in vinegar.

ACID SET: A process in which acid, usually lactic acid or acetic acid, is added to milk until a coagulum or clot is formed. This happens at pH 4.6 and is used in Cottage, cream, and chevre cheese manufacture.

ACID: A substance with a low pH, meaning it has many hydrogen ions. Also, a descriptive term to say that a cheese is tart or sour and has too low of a pH.

ADJUNCT CULTURES: Bacteria added for the purpose of enhancing flavor development in cheese.

ADULTERATED MILK: Milk that has been either intentionally or incidentally contaminated or debased by addition or substitution of substances which adversely affect the quality and/or safety of the milk.

AEROBIC PLATE COUNT: Sometimes called Standard Plate Count, a method to determine the total number of microbes in



a sample, specifically those that can grow in the presence of oxygen, usually expressed as number of microbes per ml or gram of sample.

AEROBIC: Microorganisms that require oxygen to grow.

AGAR PLATES: A growth medium for microbes that allows for the growth and enumeration of the number of microbes in a sample of milk, cheese, or whey.

ALKALINE: A substance with a high pH, characterized by a lack of acidity. Also referred to as basic.

ALKALINE PHOSPHATASE: See phosphatase.

AMINO ACIDS: The building blocks of proteins, much like letters are the building blocks of words. There are 20 amino acids.

ANEROBIC: Microorganisms that can only grow in the absence of oxygen.

ANNATTO: A natural vegetable color derived from the seed of a shrubby tree grown in South America. Used to color some cheese varieties like Cheddar and Colby orange.

ANTIBIOTICS: Anti-bacterial compounds used to treat bacterial infections such as mastitis in dairy cattle and other animals. All loads of milk must be tested for the presence of antibiotics before the milk is commingled with other milk and processed.

ASH: The minerals found in milk, cheese, or any food.



BABCOCK FAT TEST: Developed by Prof. Steven Babcock at the University of Wisconsin in the 1890's, the first practical laboratory method to easily determine the fat content of milk and dairy products.

BACTERIA: Microscopic living organisms, typically unicellular. Some are harmful and cause disease (i.e. *Listeria*), some helpful in making foods like cheese and yogurt (*Lactococcus lactis*, *Streptococcus thermophilus*).

BACTERIOPHAGE: Often shortened to just Phage, these are viruses that in cheese making attack the starter culture bacteria, and in the process of replicating copies of the infecting virus they destroy the bacterial culture cells.

BALANCE TANK: A tank holding raw milk just ahead of the pasteurizer that feeds the pasteurizer and ensures the availability of a constant flow of milk to the pasteurizer.

BETA-CAROTENE: A yellow pigment found in grasses and dark yellow vegetables. It is dissolved in fat and gives butter or cheeses made from milk of grass-fed animals a yellow color.

BINARY FISSION: The way bacteria multiply, by dividing each cell in half, so that 1 bacterium becomes 2 bacteria, and 2 bacteria become 4 bacteria, etc.

BLEACHED: The loss or reduction of color (whiter) often caused by exposure to light or low pH.



BLEND TEMPERATURE: In a dairy farm raw milk bulk tank, the maximum temperature reached when warm milk from the current milking is commingled with cold milk in the bulk tank from a previous milking or milkings.

BODY: A term used to describe how much resistance to squeezing and deformation curds of cheese have, usually determined by squeezing a mass of curds in your hand.

BREED: The genetic type of dairy cow (groups of cows having similar characteristics like color), the common U.S. breeds include Holstein (black and white; red and white), Jersey, Brown Swiss, Ayrshire, Guernsey, and Milking Shorthorn.

BRINE: A saltwater solution used to add salt to blocks or wheels of cheese.

BUFFERING: In the dairy industry it is the increase in pH of cheese after an initial decrease in pH. It is seen when acid is added directly to milk or in brined cheeses. It is primarily the result of released phosphate (from calcium phosphate) molecules absorbing acid ions.

BULK STARTER: A form of starter culture where a tank of sterilized growth media is inoculated with pure strains of starter culture bacteria and allowed to grow under controlled temperature and sometimes controlled acidity (pH) conditions



in order to produce a concentrated cell mass of bacteria culture cells.

BULK TANK: A mechanically refrigerated stainless steel vessel to hold raw milk on a dairy farm, normally found in the milk house.

BULK TRUCK: A truck with a stainless steel insulated tank that picks up milk from farmers with bulk tanks and delivers the milk to the cheese plant.

BURST SIZE: The approximate number of copies a phage or bacteriophage virus makes of itself when it infects 1 starter culture bacterial cell and then bursts the bacteria cell to liberate the replicate viruses.

BUTYRIC ACID: One of the most important fatty acids found in milk and dairy products. A short chain fatty acid, largely responsible for the typical piquant flavors found in cheeses such as Romano and aged Provolone made with lipase treated milks.

CALCIUM CHLORIDE: Normally a liquid solution of dissolved calcium chloride (CaCl_2) that is sometimes added to the milk in the vat for cheesemaking to promote the activity of the coagulant and achieve a firmer set and curd body. Is considered a processing aide and is not required to be labeled in the cheese ingredient declaration.



CALCIUM LACTATE CRYSTALS: A solid form of lactic acid which is linked with calcium. Lactic acid formed during the fermentation of lactose combines with soluble calcium to form calcium lactate. When the concentration of calcium lactate is high enough it will precipitate to form crystals.

CALCIUM PHOSPHATE: The main type of mineral found in milk and cheese, that serves like a glue to bind the strands of casein protein together.

CALCIUM: A shortened version of the term calcium chloride, a substance sometimes added to milk during cheese making to stimulate the activity of the coagulant.

CAN MILK: Milk delivered from the dairy farm to the cheese plant in 10-gallon stainless steel (formerly steel cans that were tinned). Typically cooled in a cool water tank.

CAPROIC, CAPRYLIC, AND CAPRIC: Medium length fatty acids that when cleaved from the glycerol backbone by lipase enzymes are often associated with goaty and sheepy flavors in cheeses made from goat and sheep milk.

CARBOHYDRATES: Substances like sugars and starches, utilized by microorganisms as well as humans as a source of energy.

CASE HARDENING: The term used to describe the formation of a tough skin on the surface of a cheese curd when during cooking, the curds are heated too rapidly. Also used to describe



the formation of a rind on a wheel of cheese that is submersed in too high of a salt concentration of salt brine.

CASEIN MICELLE: A suspended large particle of aggregates of thousands of molecules of casein.

CASEIN TO FAT RATIO: Abbreviated C/F, the casein content of the milk divided by the fat content of the milk.

CASEIN: The main protein found in milk, typically between 80-83% of the proteins in milk, exists in the form of micelles, and is the protein that forms the network of the cheese. There are 4 types of caseins in milk: alpha s1, alpha s2, beta, and kappa.

CHALKY: A mouthfeel sensation of very tiny particles of cheese. Often observed in cheeses with a low pH.

CHARGE: Proteins contain groups that carry a small negative or positive charge. Sometimes described as electrostatic interactions. These charges can be attractive or repulsive to nearby proteins depending on what the charge is on that protein. Proteins having the same charge (e.g., positive and positive) repel one another just like the same poles of a magnet. Whereas opposite charges (a positive and a negative) would be attractive (making the proteins stick together). At the pH of milk, the milk proteins generally carry a negative charge, and at very acidic pH values they carry a positive charge.



CHEDDARING: The process of manually flipping the slabs of cheddar curd at regular intervals over some period of time to develop a solid, almost chicken breast like texture of the cheese prior to milling. Also accomplished automatically in a draining and matting conveyor machine.

CHEESEMAKING EFFICIENCY: How well the cheesemaker captures the majority of the fat and protein from the milk into the cheese while optimizing the moisture content in order to optimize the cheese yield for a given batch of milk.

CHEESE SOLIDS: The amount of milkfat, protein, sugars, minerals, and salts in a piece of cheese.

CHEESE YIELD: See Yield.

CHEESE YIELD POTENTIAL: The maximum amount of cheese a cheesemaker could theoretically obtain from a batch of milk given the fat and protein (casein) content of the milk.

CHYMOSIN: The main protease found in the stomachs of young ruminants, which means it is the main protease enzyme that coagulates milk when veal (calf) rennet is used to make cheese.

CITRIC ACID BACTERIA: A group of starter cultures used in dairy that ferment the small amount of citric acid found in milk into buttery flavored compounds like diacetyl and small amounts of carbon dioxide. Bacteria in this group include *Leuconostoc* and *Lactococcus diacetylactis*.



CLARIFICATION: Removal of extraneous materials in milk like hay, straw, dirt particles, hair, insect parts through centrifugal force or filters.

CLARIFIER: a mechanical device that has a bowl that spins at high rates of rpms which removes extraneous materials from the milk by spinning them (sludge) out of the milk.

CLEAN IN PLACE (CIP): A method to wash dairy processing equipment without dismantling the equipment by circulating hot cleaning chemical solutions through the equipment.

CLEAN OUT OF PLACE (COP): The manual dismantling of equipment for hand scrubbing and washing usually in a tank.

CLOSED BODY: Refers to a cheese where the curds have knit to form a solid mass of cheese without any openings. It is a desired characteristic in Cheddar cheese.

COAGULANT: Enzymes added to milk that coagulate the milk. Historically derived from veal calf and other species of young animal stomachs, now coagulants can be derived from certain species of mold (microbial), from a fermentation process by genetically modified microorganisms, or from certain plant species such as Thistle flowers.

COAGULATION: the process of coagulating milk, most commonly by adding a coagulant, but sometimes accomplished with acid development, or added acid and heat.



COAGULUM: Another word for clotted (coagulated) milk.

COAGULUM FIRMNESS: The firmness of the gel at cutting the vat. The coagulum progressively changes in firmness over time after renneting, starting out weak, and progressing to an ever-firmer gel, eventually getting to the point of being very hard if allowed to go that long.

COCCI: Plural of coccus, the name given to bacteria that have a round shape when viewed under the microscope.

CODE DATE: The calendar date assigned by the manufacturer or marketer to the suggested end of shelf life of a dairy product.

CODE OF FEDERAL REGULATIONS: Abbreviated CFR, definitions for dairy products and standards of identity of various cheese varieties (e.g., required composition) are listed in this federal document. See 21 CFR 133 for Cheese Standards of Identity.

COLIFORMS: A group of bacteria, all gram negative rods that ferment lactose with the production of acid and gas at 37°C, that are often enumerated in milk and dairy products as a indication of the sanitary conditions under which the milk or dairy products were produced. Some bacteria genera that are included in the coliform family include *Escherichia*, *Klebsiella*, *Citrobacter*, *Enterobacter*, and *Hafnia*.



COLLOIDAL CALCIUM PHOSPHATE: Abbreviated as CCP. The insoluble fraction of calcium phosphate in milk or cheese that is directly attached to the casein protein.

COLONY: One dot or cluster of microbes growing on an agar or Petri film plate.

COLOR: A generic term used for pigments added to milk to change the color of the cheese, typically to an orange color. Annatto is the most commonly used pigment used to make colored cheese.

COLOSTRUM: The name given to the abnormal milk, high in immunoglobulins, that a cow gives for the first few milkings after calving (freshening).

COMMINGLING: Mixing together, often in a bulk milk truck or cheese plant milk silo, raw milk from different dairy farms, or even raw milk from different dairy species.

COMPETITIVE CULTURES: The term given to starter cultures in cheese and other fermented dairy products that have the potential ability to out compete undesirable bacteria for food and growth in the dairy products causing the undesirable bacteria to die off over time.

CONDENSED SKIM MILK: Skim milk that has been concentrated, typically by an evaporator, possibly by membranes, normally to around 30% solids.



COOK TEMPERATURE: The highest temperature reached during cooking. Lower temperatures are used in higher moisture cheeses.

COOKER STRETCHER: Sometimes called a mixer/molder, a piece of equipment used in Mozzarella and Provolone production that stretches and kneads the Mozzarella or Provolone curd in hot water to form a warm, plasticized mass of cheese with a fibrous, stringy texture.

COOKING: The heating of the curds and whey.

COVALENT BOND: Is a chemical bond between two molecules, which is usually “permanent” or relatively hard to break, examples are H₂O (water) or the peptide bond that holds the amino acids together that make up the protein chains. Heating whey proteins causes the formation of new covalent bonds in whey proteins, causing permanent changes in the structure of those proteins.

COW WATER: Water that has been condensed from a milk or whey evaporator or water that has permeated the membranes of a Reverse Osmosis unit.

CREAM: When milk is separated, the portion of the separated milk that contains most of the milkfat. The fat content is often around 40%.



CROSS CONTAMINATION: The act of raw milk contaminating already pasteurized milk, resulting in a food safety risk.

CULTURE HOUSE: A company that specializes in the propagation, packaging, distribution and sale of starter cultures to the cheese and dairy industry.

CULTURE ROTATION SYSTEM: A systematic way to rotate different strains of starter cultures used in a cheese plant so that phage don't build up to high levels and destroy any 1 strain of starter culture. A way of breaking the cycle of specific phage type replication.

CULTURE: Same as starter culture.

CURD KNIFE: Traditionally a stainless harp strung with wires that when drawn through the coagulum gel will 'cut' the curd into the desired sized cubes.

CURD MILL: A piece of cheese making equipment that cuts the matted curd into small cheese curds (to make it easier to salt).

CURD RINSE: After whey removal, water is sprayed onto the cheese to cool the curd and increase moisture. Cool curd may not knit and therefore this process is used when mechanical openings are desired such as in Colby cheese.

CURD WASH: After most of the whey has been removed water is added to dilute the lactose content of the curd. It is similar to whey dilution in that it results in a cheese with less acidity.



CURDY: A mouthfeel sensation or appearance of a cheese that results from the incomplete knitting of curds after pressing. Individual curd particles can be seen as well as detected by chewing or squeezing a plug of cheese.

CURING: Aging or ripening the cheese under controlled environmental conditions for proper flavor and texture development.

CUT OR CUTTING: The process of forming small curd particles from clotted milk. Cut time is the time from addition of the coagulant to the time the coagulum is cut.

DAYS IN MILK: Similar to Stage of Lactation but more specific, the exact number of days since calving for a cow currently being milked.

DEAD END: A stub of piping sticking out from a linear pipeline conveying fluid dairy products, often in a T shape, that results in product sitting in the pipe stub with little movement and also doesn't allow CIP cleaning solutions to pass through and properly clean the stub.

DEAD VAT: A vat of cheese where the acid formation stops usually due to the presence of phage which kills the majority of the starter bacteria in the cheese.

DEATH PHASE: The phase in the bacterial growth pattern after the stationary phase where living bacteria begin to die off at a



rapid rate due to depletion of nutrients and/or accumulation of waste products.

DENATURATION: The process that causes proteins to lose their shape or unique structure. It can be caused by exposure to heat or exposure to acids or bases. The whey proteins can be denatured by heat.

DIRECT MICROSCOPIC CLUMP COUNT: Often abbreviated DMCC, a quick way to estimate the number of bacteria in a liquid sample like milk or bulk starter by staining a known quantity of the liquid on a glass slide and then viewing and counting the number of stained bacteria under a microscope.

DIRECT SET CULTURES: Starter cultures prepared by a culture house that are pre-concentrated and are added directly to a vat of milk.

DIRECT VAT SET: Abbreviated DVS. See Direct Set Cultures.

DISSOCIATION: The tendency of certain molecules, such as calcium phosphate, to split apart. All acids dissociate and release hydrogen ions.

DIVERT FLOW: When the milk after the holding tube in a pasteurizer is directed by the divert valves back to the balance tank and back again through the pasteurizer due to not meeting minimum pasteurization temperatures at the end of the holding tube.



DRAIN TABLE: A piece of cheese making equipment used after the vat to allow for whey drainage and proper acidity and moisture control of the curd.

DRT THERMOMETER: A Digital (Electronic) Reference Thermometer at the end of the holding tube in a HTST pasteurizer.

DRY COW: A cow in between lactations that is not currently being milked.

DRY SALTING: The process of salting curd by evenly spreading dry salt on the surface of the curds and then stirring the salt in with the curd.

DRYING OFF: The process of stopping the milking of a cow at the end of a lactation, usually at around 305 days after calving.

ENCLOSED VAT: A vat that is entirely enclosed and not directly exposed to the environment or atmosphere.

ENZYME: A specific type of protein that can break bonds between molecules. The molecules are called its substrates and are subsequently broken apart into two molecules. In doing so the enzyme is not impacted in any way. Some enzymes can form bonds between molecules. Enzymes function to speed up reactions (catalysts) but are not changed by the reaction. Lipases and proteases are the main enzymes of importance in



cheese production and ripening. Most enzymes end in the letters ‘-ase’.

EXPONENTIAL PHASE: The phase of bacterial growth after the lag phase where the bacteria reproduce by binary fission at a very rapid rate.

FACULTATIVE: Microorganisms that can grow both in the presence of or the absence of oxygen.

FAT ON A DRY BASIS: Abbreviated FDB or FDM (fat in dry matter), the amount of fat in the cheese divided by the total amount of solids in the cheese times 100.

FATTY ACIDS: See Free Fatty Acids.

FDA: The U.S. Food and Drug Administration. They have jurisdiction over all dairy products that cross state lines and are thus entered into interstate commerce.

FERMENTATION: The process of controlled microbial growth in certain foods and beverages under anaerobic conditions (no oxygen) where the microbes, such as yeast (wine, beer) and bacteria (cheese, yogurt), break down food components, principally sugars, into other products such as lactic acid (cheese, yogurt) or alcohol (wine, beer).

FERMENTATION PRODUCED CHYMOSIN: Abbreviated FPC, this is a chymosin based coagulant (rennet) produced through a genetic engineering process where the gene from a calf or



other young ruminant is transferred to a microbe, and through a fermentation process the microbe then produces an exact copy of the chymosin enzyme produced by the animal, which is then extracted and purified for use in cheese manufacture.

FINES: Small particles of cheese, which often escape in the whey.

FINE SAVERS: Mechanical equipment designed to remove the cheese fines from a whey stream.

FLOW DEVERSION DEVICE: A series of two valves in a fail-safe arrangement in series after the pasteurizer holding tube that control the flow direction of milk. If the electronic thermometer indicates minimum pasteurization temperatures have been met, the valves will set to the forward flow position (green) to allow milk to travel to the vats. If the electronic thermometer indicates the milk is not at the minimum pasteurization temperature (red) at the end of the holding tube, the valves will set to the divert flow position to direct the milk to cycle back through the pasteurizer again.

FOOD CODE: A national set of rules and regulations for the safe production and handling of foods to prevent food borne illnesses.

FOOD PRESERVATION: The craft of extending the shelf life of a perishable food. In cheese making, typically the use of cultures



that produce lactic acid to lower the pH of the cheese, together with the removal of much of the water (whey) from the milk and the addition of salt.

FORTIFICATION: In cheese making, adding extra milk solids, primarily milkfat and milk proteins, to milk prior to cheese making to increase the cheese yield potential of the milk.

FORWARD FLOW: When the milk flow in a pasteurizer at the end of the holding tubes has been verified by the electronic thermometer as having met minimum pasteurization temperatures the milk is directed by the flow diversion valves to proceed on towards the vats.

FREE FATTY ACIDS: Chains of various lengths of fatty acids cleaved from the glycerol backbone of triglycerides by the action of lipase enzymes. They can cause off-flavors.

FREEZE DRIED CULTURES: Starter cultures that have been dried so they don't require refrigeration in storage.

FRESHENING: The term given to a cow having a calf so that it begins giving milk again.

FUNGI: A class of microorganism that include mold and yeast.

GALACTOSE: a single sugar (monosaccharide), one half of the lactose molecule, not as easily fermented by some varieties of lactic acid bacteria.



GLUCOSE: a single sugar (monosaccharide), one half of the lactose molecule, easily fermented by most varieties of lactic acid bacteria.

GLYCOLYSIS: The breakdown of sugars into lactic acid by enzymes of starter cultures during cheese manufacture.

GOOD MANUFACTURING PRACTICES: Often abbreviated GMPs, these are practices regarding personnel, facility construction and maintenance, and food processing conditions to ensure the production of safe and high quality foods.

GRADE A MILK: The highest sanitary standards for milk production and processing, required for all milk that is to be bottled, produced, processed and distributed in compliance with Grade A milk regulations promulgated in the federal Pasteurized Milk Ordinance (PMO).

GRADE B MILK: Sometimes called manufacturing grade milk, this is raw milk other than Grade A milk and produced and processed under less stringent quality standards than those required of Grade A milk.

GRAINY: A mouthfeel sensation of very small particles of cheese. Often observed in cheeses with a low pH.

GRAM NEGATIVE: The term given to bacteria that when subjected to the Gram stain procedure appear red under the microscope. Is a primary way to classify and identify bacteria.



GRAM POSITIVE: The term given to bacteria that when subjected to the Gram stain procedure appear purple under the microscope. Is a primary way to classify and identify bacteria.

GRAZED MILK: Milk produced by cows that eat primarily grasses and vegetation found in their pasture.

HALAL: Foods produced according to Islamic rules for food processing and consumption which are then permitted to be eaten by those observing Islamic teachings. For cheese making, a principle issue is the type of coagulant used.

HAZARD ANALYSIS CRITICAL CONTROL POINTS: Abbreviated HACCP, a food safety system designed to identify the critical points in a process that must be controlled to ensure the safety of the finished food.

HEAL TIME: The amount of time immediately after cutting the vat that the curds are allowed to sit undisturbed so that a skin can form on the outside of the curd to prevent further fat losses.

HEATING SECTION: The part of a pasteurizer heat exchanger that heats the milk up to greater than the minimum pasteurization temperature, which is typically 161°F for milk for cheese manufacture.



HEAT-TREATMENT: Any form of increasing the temperature of milk or whey but to less than the minimum temperature and time required for legal pasteurization.

HEIFER: A young female dairy cow.

HETEROFERMENTATIVE: Refers to bacteria that ferment sugars to produce acids and carbon dioxide gas.

HIGH TEMPERATURE SHORT TIME: A continuous flow pasteurizer that heats the milk up rapidly to greater than the minimum temperature, holds it for a short period of time at that temperature, and then immediately cools it down to the desired temperature for milk in the cheese vat. Typically, minimum times and temperatures for cheese milk are 161°F for 15 seconds.

HOLDING TUBE: In a HTST pasteurizer, after the heating section, a specific length of pipe arranged in an upward spiral fashion that, together with the velocity of the milk flow, ensures that the minimum hold time for milk at the minimum pasteurization temperature or greater is accomplished.

HOMOFERMENTATIVE: Refers to bacteria that ferment sugar to produce acids, but no gas is produced. All starters are homofermentative.



HOMOGENIZATION: Breaking up the fat globules in milk into many numerous smaller globules, typically done with pressure. The machine that does this is called a homogenizer.

HOOPING: The process of putting the curds of cheese into some type of form which determines the shape of the cheese, such as a wheel or block of cheese.

HYDROGEN ION: An ion is any molecule or atom that has an electrical charge, either positive or negative. A hydrogen ion is an atom of hydrogen and it has a positive electrical charge. Hydrogen ions are released from acids and their concentration in water is called pH.

INDICATING THERMOMETER: A thermometer placed at the end of a pasteurizer holding tube that serves to tell the operator what the temperature of the milk is at the end of the holding tube.

INDICATOR ORGANISMS: Nonpathogenic microbes whose presence in foods serve as indicators of the sanitary conditions under which the food was manufactured. Examples include coliforms, yeast, mold, and members of the bacterial family *Enterobacteriaceae*, a group of contaminant bacterial genera of gram-negative rods.



INTAKE: The room in a cheese plant where milk is received from either bulk milk trucks or milk can trucks. Also known as receiving room.

ISOELECTRIC POINT: The pH (acidity) at which a protein has equal number of positive and negative charges. For casein, the isoelectric point is about pH 4.6. At this pH, milk coagulates which is used in dairy product production like cottage cheese and yogurt.

KOSHER: Following the Jewish food processing and dietary regulations of kashrut. For cheese making, the primary issue is what type of coagulant is used, as animal derived coagulants are generally not allowed to be used.

LACTASE: The enzyme that cleaves the lactose disaccharide sugar molecule into its 2 monosaccharide sugar molecules, glucose, and galactose.

LACTATION: The time from when a cow has a calf and starts producing milk until the cessation of milking the cow in preparation for having another calf, approximately 305 days long.

LACTIC ACID BACTERIA: A certain group of bacteria that produce lactic acid from the fermentation of carbohydrates, in the case of dairy, lactose.



LACTIC ACID: The type of acid typically found in cheese from the fermentation of lactose by bacteria into lactic acid.

LACTIC CHEESE: Curd formed by low pH but with no coagulant added. Chevre is an example. Also called acid set cheese.

LACTOSE: The sugar contained in milk, a disaccharide (2 sugars linked together) of glucose and galactose.

LAG PHASE: The initial stage in a bacteria growth curve, where there is little increase in bacterial numbers as the bacteria prepare themselves to begin to grow, but they don't yet have the ability to divide by binary fission.

LEUCINE CRYSTALS: Leucine is an amino acid found in casein. During ripening the casein is broken down into free amino acids. Leucine is not very soluble in water and when sufficient quantity is released it will precipitate as leucine crystals. Their appearance is considered as an indication of a well-aged and flavorful cheese. The crystals are flavorless. Have been found commonly in Blue-veined and Parmesan cheeses.

LIPIDS: Another name for types of fat.

LIPOLYSIS: The breakdown of fats with the liberation of free fatty acids during cheese aging by enzymes called lipases.

LONG BODY: A cheese that is very pliable so that it bends substantially when pressure is applied to it. A trier plug of cheese is tested to see if it bends. If the plug bends without



breaking it is called long. Quality Swiss and Mozzarella cheeses have a long body.

LOW TEMPERATURE LONG TIME: A batch style pasteurizer where the milk is heated to a minimum of 145°F and held at that temperature for a minimum of 30 minutes in properly designed and operated equipment.

LUMPING OF CURD: Undesirable curd fusion resulting in unwanted large lumps or balls of curd.

LYTIC CYCLE: The cycle a bacteriophage goes through to replicate itself, starting with adsorption onto the bacteria cell, through lysis or bursting of the bacterial cell to liberate the replicated bacteriophages.

MAG METER: A meter installed in the milk flow of a pasteurizer that controls the velocity of the flow of milk when using a centrifugal pump in a milk pasteurizer.

MAKE PROCEDURE: A systematic record keeping of the entire cheese making process including times, temperatures, ingredients, titratable acidities, pH's, and any irregularities.

MAKE TIME: The time from adding coagulant to the vat until the curd is salted (in dry salted cheeses) or milled, stretched or hooped (in brine salted cheeses).

MASTITIS: Inflammation of a cow's mammary gland/udder, usually caused by a bacterial infection.



MATTING BELT: Often termed a DMC (Draining and Matting Conveyor), a piece of cheese making equipment used after the vat to drain the whey and allow the curds to fuse (mat) together into a solid mass.

MEALY: A mouthfeel sensation of small particles of cheese. generally observed in dry and cheese with a low pH or high in salt.

MEMBRANE SEPARATON: The use of a type of filter material with specific pore sizes that can be used to partition, typically under pressure, components of milk or whey (fat; protein; lactose; minerals; water) based on the size of the components.

MESOPHILES: In the dairy industry these are bacteria that grow best between 68°F and 90°F. Generally, refers to starter bacteria in the genus *Lactococcus*.

MICROBES: A broad range of living microscopic organisms including bacteria, yeast and mold. But not viruses which are defined as being nonliving.

MICROBIAL COAGULANTS: Developed in the 1970s, these coagulants are enzymes derived from different mold species like *Rhizomucor miehei* or *pusillus* or *Cryphonectria parasitica*.

MIG THERMOMETER: A mercury in glass thermometer at the end of the holding tube in a HTST pasteurizer.



MILK COMPOSITION: The milkfat, true protein, lactose and minerals (other solids) content of milk.

MILK PRODUCTION PER LACTATION: The pounds of milk a dairy animal gives in one lactation.

MILK: The lacteal secretion, practically free from colostrum, obtained by the complete milking of one or more healthy cows.

MILKFAT GLOBULE: Droplets of fat found in milk or dairy products, often surrounded by a protective membrane material.

MILKFAT: A general term for the fat found in milk.

MILLED CURD: A process in which the curds are allowed to mat together as whey is removed. There is no stirring during this process. The curd mat is cut into slabs and turned. At the appropriate time the slabs are cut (milling process) into small thumb sized pieces called curds.

MILL: See curd mill.

MINERALS: Sometimes referred to as ash, the primary minerals in milk are calcium and phosphorus.

MIXED MILK: The term given to blending milk from different species together, like cow and goat, or sheep and goat.

MIXED STRAIN CULTURES: Cultures that contain an unknown number of strains and undefined strains of starter bacteria.



MODIFIED ATMOSPHERE PACKAGING: A process in which the original air in a package (usually shredded cheese) is evacuated by inserting a mixture of gases, usually a mixture of nitrogen and carbon dioxide. Used to remove oxygen to prevent mold growth.

MOISTURE: Typically, the term used to refer to the water content of cheese.

MOTTLING OF CURD: Color variations in the cheese from dark spots to lighter spots typically as a result of curd lumping and uneven salt penetration in the curd which leads to uneven pH values in different parts of the cheese.

MULTIPLE STRAIN CULTURES: Cultures which contain two or more well defined starter bacteria strains each with known activity and special cheese making properties and characteristics.

NONFAT DRY MILK: Skim milk that has been concentrated and dried into a powder form.

NON FAT SOLIDS: The solids content of milk or cheese minus the fat content. ($100 - \text{moisture} - \text{fat} = \text{nonfat solids}$).

NON PROTEIN NITROGEN: Small nitrogen containing compounds in milk and cheese such as urea or free amino acids that are not true proteins.



NON-STARTER LACTIC ACID BACTERIA (NSLAB): These bacteria are contaminants and as the name indicates are able to ferment lactose to form lactic acid (or gas). Most common in cheese are Lactobacillus species.

OILING-OFF: The release of free liquid fat due to heating of cheese but is usually applied to baking applications such as pizza where excessive fat release forms pools.

OPEN BODY: Refers to a texture of a cheese where there are numerous irregular-shaped holes as a result of curds not knitting together. Often called mechanical holes. It is desired in some cheeses such as Colby, muenster, and Brick cheeses. It is considered to be a minor defect in Cheddar.

OPEN VAT: A vat open on the top to the environment and atmosphere.

OTHER DAIRY SPECIES: primarily goat, sheep, and water buffalo in the U.S.

OTHER SOLIDS: The total amount of lactose and minerals in milk.

OVERSTIRRED VAT: A vat of cheese where the coagulant is stirred into the milk too long which results in the breaking of bonds from the initial coagulation process, resulting in a poor set and subsequent loss of excessive amounts of fat in the



whey. The cheese from this type of vat will likely be low in fat, mottled in appearance, and grainy in texture.

PASTA FILATA: Italian for spun fiber, the term used for cheeses like Mozzarella and Provolone that are stretched and kneaded with hot water to develop their characteristic fibrous “stringy” texture.

PASTEURIZATION: The process of using heat to destroy pathogenic bacteria that may be found in raw milk. The process involves holding milk at a certain elevated temperature for at least a minimum time period to inactivate pathogenic bacteria that may be found in milk.

PASTEURIZED MILK ORDINANCE: Often referred to as the ‘PMO’, is a compilation of all the rules and regulations regarding the production and processing of Grade ‘A’ Milk and Milk Products in the United States. These rules are enforced by the FDA and State Regulatory agencies. The rules are written and revised by meetings of the National Conference for Interstate Milk Shippers, which has representatives from the FDA, the dairy processing industry, and state and local dairy regulatory agencies.

PASTEURIZER: The piece of equipment used to pasteurize milk.

PASTURE: A field of grasses or hay.



PASTY BODY: A soft and sticky mouthfeel. Often associated with high moisture and well-aged cheeses. Lower pH cheeses that are high in moisture often develop this body defect.

PATHOGENS: Also pathogenic microbes or bacteria. The Microbes found in milk and dairy products that have the potential to cause illness and disease in people who consume those products.

PEPSIN: The main gastric protease in adult animals.

PEPTIDES: Smaller segments of proteins created by enzymatic degradation of proteins during cheese aging. Certain peptides are responsible for bitterness flavors in cheese.

PERMEATE: In membrane processing, the flow stream that passes through the pores in the semi-permeable membrane and contains the smaller sized molecules in the milk or whey such as water and possibly minerals or lactose.

PETRIFILM: A more modern growth medium system to grow and enumerate microbes, produced by the 3M corporation, very thin, waxy papers impregnated with microbial growth media.

pH CONTROL BULK STARTER: A bulk starter system where the acid produced by the growing starter culture is neutralized either internally with buffers or externally with ammonium hydroxide or potassium hydroxide to keep the pH of the media



in the optimal growth zone of the starter culture to maximize starter cell numbers and health.

pH ELECTRODE: Same as pH probe, the part of a pH meter assembly that comes into direct contact with the milk, whey or cheese.

pH METER: The piece of electronic laboratory equipment that measures the pH or acidity of milk, whey or cheese.

pH PROBE: The electrode part of a pH meter assembly that comes into direct contact with the milk, whey or cheese.

pH SCALE: The range of pH's of substances expressed from 0 to 14, with 0 being extremely acidic (battery acid), 7 being neutral (pure water), and 14 being extremely alkaline or basic (drain cleaner, caustic soda).

pH: A measure of the acidity or the number of hydrogen ions in a substance.

PHAGE INHIBITORY MEDIA: Powdered media designed to be rehydrated and sterilized to use to grow starter cultures in a bulk media system. This media typically contains calcium chelators (binders) like phosphates and citrates to make calcium unavailable for bacteriophage replication.

PHAGE: See Bacteriophage.



PHOSPHATASE: An enzyme found in milk that is an indicator of whether or not the milk was adequately pasteurized. If this enzyme is found in milk that was thought to be pasteurized, it indicates pasteurization was not properly done. This enzyme is used to verify that milk was properly pasteurized when a seal was broken on the pasteurizer.

PLATE LOOP COUNT: A method used to determine the number of bacteria in a sample of raw milk, requiring a specific apparatus to quickly sample the milk and disperse the milk sample onto a Petri plate, using a syringe, calibrated platinum loop, and a bottle of sterile diluent attached to the syringe.

POST PASTEURIZATION CONTAMINATION: Contamination of the milk or cheese with undesirable microbes occurring during the cheese making process but after the pasteurization of the milk.

PREACIDIFICATION: The addition of acid prior to the addition of the coagulant. Often used with high casein milks or when direct set cultures are used.

PREDRAW OF WHEY: The practice of draining off 40-60% of the whey in a vat after cooking to allow for faster pH drop and firming of the body of the curd.



PREMIUMS: Payments made by cheese manufacturers to dairy farmers for their milk above and beyond minimum prices set by the USDA.

PRESSING: The act of putting pressure on the bulk container of cheese after hooping to help the curds fuse together.

PRESSURE DIFFERENTIAL: The concept that the pasteurized milk on the pasteurized side of the regenerative section of a milk pasteurizer must legally be at a higher pressure than the raw milk on the raw side of the regenerative section so that if there were to be a leak in the heat exchanger plates pasteurized milk would always leak into raw milk but never vice versa.

PROCESSING AID: A substance added during the cheese making process to assist in the process of the cheese making but that has been deemed to be incidental and thus doesn't need to be declared in the ingredient label. Examples include calcium chloride added to assist in coagulation or defoamers added to prevent excessive foaming of the milk.

PRODUCT CONTACT SURFACE: Any piece of cheese making equipment surface that directly contacts the product (milk, cheese, whey).



PRODUCT RECOVERY: Usually a voluntary bring back of product due to a quality problem but not a food safety issue from customers but usually not the final consumers.

PROTEINS: Building blocks of muscles and other structures in animals and microbes, they are comprised of strings of amino acids hooked together in long chains.

PROTEOLYSIS: The breakdown of proteins during cheese aging by enzymes from the culture, the coagulant and from bacterial contaminants in the cheese. Proteins are broken down first into shorter units called peptides, and sometimes all the way down into amino acids.

PSYCHROTROPHS: In the dairy industry these are bacteria capable of growing at refrigeration temperatures although they can grow better at warmer temperatures.

RANCIDITY: A taste sensation caused by free fatty acids. In some cases rancidity is undesirable (i.e. rancid cheddar cheese) in other cases it is desirable (Romano and aged Provolone cheeses).

RAW MILK: Milk that has not been pasteurized.

RECALL: Can be voluntary or mandatory, the bringing back of a specific lot, or lots, of product from the entire distribution chain including customers and consumers, usually due to the risk of a



food safety issue with potential for consumption of the product causing illness or injury.

RECLAIMED WATER: Water in a dairy plant that has been reclaimed from heat exchangers processes, or the condensing of milk or whey, or from a reverse osmosis membrane system so that the water can be used for other purposes like boiler make up water or cleaning of equipment.

REGENERATIVE SECTION: That section of the heat exchanger of a milk pasteurizer designed for heat recovery and energy efficiency. In this section, the hot, pasteurized milk gives up its heat to the cold, raw milk. Thus this section of heat exchanger has a raw side and a pasteurized side. The milk leaving the pasteurized side typically leaves the heat exchanger at the desired set temperature of the milk in the vats.

RENNET: Coagulants derived from young ruminant stomachs. Typically a mixture of chymosin and pepsin.

RETENTATE: In membrane processing, the stream of materials that contain milk components such as fat or protein that are too large to pass through the membrane.

RIBOFLAVIN: A water soluble vitamin found in milk and cheese; the cause of the greenish color seen in used cheese brines.



RIPENED CHEESES: Those varieties of cheese that must undergo some time period of curing after manufacture before they obtain the desired flavor and quality.

RIPENING (milk for cheese making): The time from adding starter in the vat until the coagulant is added, which allows the starter culture to begin to grow and produce lactic acid.

RIPENING (cheese aging): The process of curing the cheese at a given temperature for a given period of time to allow for desired flavor development, body and texture development.

ROD: Or Bacilli, the term given to bacteria that have a long, thin, rod-like shape under the microscope.

SALINITY: The salt content of a brine solution.

SALT: Sodium chloride (NaCl) added during the manufacture of most cheeses to add flavor to the cheese, draws out moisture, and acts as a preservative.

SANITIZER: Hot water, steam, or chemicals such as chlorine that are designed to kill any remaining viable bacteria on a product contact surface after proper cleaning has taken place.

SANITIZING: The destruction of viable bacteria on a product contact surface after proper cleaning through the effective use of a sanitizer agent.



SATURATED FATTY ACIDS: Fatty acids that have no double bonds in their carbon chains.

SCALDING: Refers to increasing the temperature of curds and whey. It is generally a European cheesemaking term; in the US, we call it cooking.

SEAMINESS: A characteristic of a cheese in which the individual curd particles are outlined in white.

SEDIMENT: Extraneous materials found in raw milk including straw, hay, dirt, hair, insect parts, etc.

SEPARATOR: A mechanical machine that uses centrifugal force to remove cream from milk or whey.

SETTING THE VAT: The term given to the process of adding coagulant to the vat. Synonymous with renneting.

SHELF LIFE: The period of time between production of the dairy product, (i.e. milk, yogurt, cheese, etc.) and when it is no longer advisable to consume due to potential deterioration of the quality.

SHORT BODY: A cheese that is not pliable so that it breaks when pressure is applied to it. Often associated with a cheese with a low pH. A trier plug of cheese is tested to see if it bends. If the plug breaks without bending it is called short.



SILOS: Vertical tanks used for storage of milk or whey, typically insulated, with an agitator, often with mechanical cooling.

SINGLE STRAIN CULTURES: Cultures containing one strain of well characterized bacteria.

SKIM: When milk is separated, the portion of the milk that doesn't have hardly any fat in it. It is composed mostly of water, milk proteins, lactose and minerals.

SLABBING THE CURD: Cutting the curd into large, rectangular cheese slabs that subsequently can be turned and cheddared.

SLOW VAT: A vat where the acid formation is slower than anticipated, usually due to the presence of phage that attacks and kills some of the lactic acid forming starter bacteria.

SOAPY: A descriptive taste sensation of rancidity in mostly Italian style cheeses reminiscent of eating soap. It is caused by the release of fatty acids by lipases.

SOIL: The term used in dairy processing to refer to food substances like milkfat, protein, or minerals left on product contact surfaces after production runs.

SOLIDS: For milk or cheese, 100 minus the water content.

SOMATIC CELL COUNT: Abbreviated SCC, a counting of the number of somatic cells in raw milk and expressed per ml of raw milk. High levels indicate mastitis.



SOMATIC CELLS: In strict biological terms any cell in the body that can divide is called a somatic cell. However in the world of dairy products we generally mean only leukocytes (white blood cells) and they cannot divide or multiply. They generally get into milk via blood entering the milk through an infection in the udder. The white blood cells are part of the immune system to fight infections.

SPORES: Dormant forms of certain bacteria. Often called endospores by microbiologists, they are formed by bacteria under adverse conditions and can survive pasteurization. Some may be aerobic (*Bacillus* sp.) and others are anaerobic (*Clostridia* sp.).

STAGE OF LACTATION: The timepoint a cow is at in her lactation cycle. Cows typically lactate a minimum of 305 days in one cycle. Often categorized as early lactation, mid lactation, late lactation.

STANDARD PLATE COUNT: A method to enumerate the total number of bacteria in a sample, typically expressed in number of bacteria per ml or per gram.

STANDARDS OF IDENTITY (cheese): Regulations promulgated by FDA in the Code of Federal Regulations Title 21 Part 133 Cheeses which describe legal definitions of many, but not all, cheese varieties, give limits on moisture and fat concentrations, as well as allowed ingredients and typical make procedures.



<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?CFRPart=133>

STARTER CULTURE: Also simply called ‘Starter’, Lactic acid bacteria added to milk during the start of the cheese making process. The main function of starter culture is producing lactic acid from lactose. They also contribute to the ripening process of cheese.

STATIONARY PHASE: The phase of the bacterial growth curve after the exponential phase where the multiplication of bacteria levels off due to depletion of nutrients and/or accumulation of waste products.

STERILE: Food or equipment that has no living bacteria or bacterial spores in or on it.

STIRRED CURD: Curd that is prevented from matting or fusing together by continuous stirring. Sometimes also called granular curd.

STIR OUT TIME: The amount of time the cheese curds are stirred in the whey in the vat after cooking is completed.

STRETCHED CURD: The process of kneading and stretching curds of cheese in hot water in the process of making pasta filata cheese varieties like Mozzarella or Provolone.

SUBSTRATE: The molecule or substance that the enzyme reacts with, typically in dairy a protein, fat, or sugar.



SWEATING: The loss of moisture to the cheese surface.

Generally due to exposure to excessive heat, and either low or high pH.

SWEET CREAM: The cream produced by running milk through a separator prior to cheese manufacture.

SWEET: The term used to describe a cheese flavor that lacks the amount of acid that is desired. Has nothing to do with the sweetness of sugar.

SYNERESIS: The loss of whey from curd or cheese. It is the result of tightening of the protein mainly due to an increase in temperature and an increase in acidity.

TEXTURE: Although often used synonymously with body, it refers to the degree of openness of a cheese.

THERMIZATION: Heat-treatment of milk involving temperatures and times lower than required for (legal) pasteurization. It is also referred to as subpasteurization. It is used to reduce the number of microorganisms in milk but thermized milk is still considered as raw milk.

THERMODURICS: Bacteria that are extremely resistant to heat inactivation and destruction.

THERMOPHILES: In the dairy industry these are bacteria used as starters that grow best at around 100-108°F. *Streptococcus thermophilus* and *Lactobacillus helveticus* are examples.



TIMING AND SEALING: The setting and verification of a pasteurizer system to ensure that minimum pasteurization times and temperatures are automatically accomplished during the pasteurization of milk. Timing specifically refers to ensuring the milk is held at temperature for at least the minimum time required. Sealing refers to locking the critical controls and equipment to prevent operators from increasing the flow of milk or decreasing the minimum temperature during operation.

TIMING PUMP: A positive pump that controls the velocity of milk flow in a milk pasteurizer.

TITRATABLE ACIDITY: Another means to measure the acidity of milk or whey by titrating the milk or whey with a weak, 0.1N base (sodium hydroxide) with a color indicator (phenolphthalein) that turns pink when the acid is neutralized.

TOTAL MIXED RATION: Abbreviated TMR, this is feed for a cow that is a blend of various components such as dry hay, fermented haylage, fermented corn silage, cottonseed meal, brewer's grains, soy meal, vitamins, minerals, and other components that provide the cow with a carefully nutritionally balanced diet for optimum milk, milkfat, and milk protein production.

TOTAL PROTEIN: Protein calculated by converting all the nitrogen containing molecules in milk and dairy products into protein.



TRIER: A metal sampling tool that looks like a pipe cut lengthwise in half. It is thrust into the cheese and with a half-twist and pulling action a plug of cheese is pulled from a larger block of cheese.

TRIGLYCERIDES: The form that fat is found in milk, consisting of 3 fatty acids attached to a glycerol backbone.

TRUE PROTEIN: Protein calculated by converting only the nitrogen found in actual proteins in milk and dairy products into protein, leaving out the nitrogen that comes from non protein nitrogen sources.

TYROSINE CRYSTALS: Tyrosine is an amino acid found in casein. During ripening the casein is broken down into free amino acids. Tyrosine is not very soluble in water and when sufficient quantity is released it will precipitate as tyrosine crystals. Their appearance is considered as an indication of a well-aged and flavorful cheese. The crystals are flavorless.

ULTRAFILTERED MILK: Milk that has been run through an Ultrafiltration membrane system to concentrate solids like fat or protein while removing some of the water, lactose, and minerals.

UNRIPENED CHEESES: Sometimes called fresh cheeses, cheeses that are not meant to be ripened and that are at peak quality and can be consumed shortly after manufacture.



UNSATURATED FATTY ACIDS: Fatty acids where there are one or more double bonds in the carbon chain.

USDA: The United States Department of Agriculture. They operate a voluntary cheese grading and cheese plant inspection service. However, any cheese purchased by the federal government for any programs must be produced in a USDA approved cheese plant.

VAT ROOM: The name of the room where all the vats are located.

VAT: The name given to a large vessel that holds a given volume of milk to be made into cheese. The vessels can be completely enclosed (closed vats) or without covering (open vats). Also, a given amount of cheese that is produced by each of these vessels.

VEGETABLE COAGULANT: Technically coagulants derived from plants like the Cynara (thistle) plant. From a practical standpoint some companies list microbial coagulants as vegetable coagulants.

VIRUSES: a submicroscopic infectious agent or parasite, much smaller than bacteria, that require a host, in the case of cheese making starter culture bacteria, to reproduce themselves. In cheese manufacture we call the viruses bacteriophage or phage.



VITAMIN A: The main fat-soluble vitamin found in milk and cheese, mostly comes from the carotenoid pigments like beta-carotene in fresh grasses that cows eat. Is found in higher levels in cows fed primarily pasture diets, causing the cheeses made from their milk to be more orange/yellow in color.

WASHING THE CURD: Spraying or soaking the curd on a drain table with cold or tempered water to remove fat from the surface of the curd, to remove lactose from the curd, and to control the amount of syneresis of whey from the curd to help control final cheese moisture content.

WASH TAG: A paper tag attached to the outlet of a bulk milk truck tank to identify when, where, and by whom the tanker was last washed.

WATER ACTIVITY: A_w or a_w It is a measure of the amount of water available for chemical or microbiological use. Pure water is defined as having a water activity of 1.0. Most cheeses have a water activity between 0.92-0.99. Salt will depress water activity. Growth of microorganisms is highly dependent upon available water and each microorganism has its own requirement. Lowering the water activity is one criteria to prevent the growth of pathogens.

WEAK: A descriptive term for a cheese that is soft due to high fat content but often observed with cheeses high in both fat and moisture and in a cheese that has been aged too long.



WHEY CREAM: The cream produced by running the whey from cheese making through a separator.

WHEY DILUTION: The partial removal of whey followed by the addition of water. This usually is done during the cooking stage. Its purpose is to dilute the lactose content of the curd to prevent excessive acidity in the cheese. Typically utilized in the manufacture of traditional Gouda.

WHEY FAT: The fat that escapes from the curd during cheese making and ends up in the whey.

WHEY PROTEINS: Soluble proteins found in milk that partition with the whey, usually account for around 17-20% of the proteins in milk. The primary whey proteins include: alpha lactalbumin, beta lactoglobulin, bovine serum albumin, and smaller amounts of lactoferrin and immunoglobulins.

WHEY: The watery, greenish liquid that results from the cutting of the coagulum during cheese making.

WISCONSIN ADMINISTRATIVE CODE: A state of Wisconsin collection of regulatory documents containing rules and regulations for, among other things, milk production, dairy product processing, cheese makers licensing, cheese grading, and bulk milk sampling.

WISCONSIN CHEESE GRADING STANDARDS: State of Wisconsin Department of Agriculture regulations defining the grade



(sensory) standards for a limited number of common varieties of cheese (Cheddar; Colby; Monterey Jack; Brick; Muenster; Swiss; Baby Swiss).

https://docs.legis.wisconsin.gov/code/admin_code/atcp/055/81.pdf

WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION: Known as WDATCP or DATCP, the governing body for milk production and milk processing in Wisconsin.

YIELD: The pounds of cheese that a cheese maker gets from a starting point of 100 lbs of milk.