Glossary of Mastitis Terms

**Acute mastitis**: Udder inflammation characterized by sudden onset, redness, swelling, hardness, pain, grossly abnormal milk, and reduced milk yield.

**Alpha toxin**: A poison produced by *Staphylococcus aureus* that causes blood vessel constriction and blood clotting.

**Alveolus**: Microscopic, spherical milk-producing unit of the udder, composed of secretory epithelial cells.

**Anaerobic (bacteria)**: Bacteria that grow in the absence of oxygen.

**Antibodies**: Proteins synthesized by the cows’ immune system that aid in the elimination of foreign substances such as microorganisms.

**Backflushing**: An automated system for sanitizing teat cup liners between cows.

**Bacteremia**: Presence of bacteria in the blood stream.

**Casein**: The major protein found in milk.

**Chronic mastitis**: Udder inflammation that continues over a long period of time, with progressive development of scar tissue and simultaneous reduction in milk yield.

**Clinical mastitis**: Udder inflammation characterized by visible abnormalities in the udder or milk.

**Cluster**: The milking unit assembly containing teat cup shells and liners, short milk and pulsation tubes, claw, and long milk and pulsation tubes.

**Coliform(s)**: Rod-shaped, Gram-negative bacteria originating from the intestinal tract.

**Complement**: An antibacterial protein found in milk that inhibits bacterial growth.

**Composite milk**: Co-mingled milk from all functional mammary glands of an animal.

**Contagious (microorganisms)**: Bacteria growing in the udder that are primarily spread from cow to cow during the milking process.

**Corticosteroid**: An anti-inflammatory hormone.
**Cytokine**: A protein produced by leukocytes, which regulates the antibacterial activity of other leukocytes.

**Droplet impact**: Microscopic droplets of milk, possibly containing microorganisms, that impact against the teat orifice near the end of milking, which may initiate a new udder infection.

**Drying off**: Process of ending lactation or the transition of mammary gland from lactating to non-lactating.

**Edema (of the udder)**: Swelling of the udder or teats caused by the accumulation of fluid below the skin.

**Emollient**: Substance that softens and soothes skin.

**Endotoxin**: A poison produced by Gram-negative bacteria that causes systemic response (fever, diarrhea, anorexia) in cows.

**Enterococci**: Gram-positive, catalase-negative cocci.

**Enterotoxin**: A poison produced by *Staphylococcus aureus* and other bacteria that causes digestive illness when ingested by humans.

**Environmental (microorganisms)**: Bacteria whose primary origin is the environment, where they can contact the udder and teats causing infection.

**Epidemiology**: A study of the relationships of various factors determining the incidence and prevalence of mastitis in a herd.

**Fibrosis**: The replacement of infected tissue areas with fibrous connective or scar tissue.

**Foremilk**: The first streams of milk stripped from the udder prior to milking.

**Forestrip**: Process by which the first few streams of the milk are expressed from the teat prior to milking to observe for abnormalities and to flush the teat canal.

**Hyperkeratosis**: A thickening of the outer layer of the skin.

**Hypoxia**: Condition in which the body or a region of the body is deprived of adequate oxygen supply.

**Immunoglobulin**: See Antibodies.

**Incidence (of mastitis)**: Rate at which mastitis cases occur (cases/cow/unit of time).

**Infection**: The presence of microorganisms growing in the udder.
**Inflammation**: A condition in which the cow’s body seeks to eliminate or neutralize invading microorganisms and repair damaged tissue.

**Involution**: The process by which udder tissue reverts to a non-milk-producing state after drying off.

**Keratin**: A waxy substance produced by cells lining the teat canal that serves as a plug between milkings and during the non-lactating period, and aids in reducing penetration of the teat by microorganisms.

**Lactoferrin**: An antibacterial protein found in milk that inhibits bacterial growth.

**Lactoperoxidase/thiocyanate/hydrogen peroxide system**: An enzyme complex in milk that inhibits bacterial growth.

**Lactose**: The major sugar present in milk.

**Let-down**: A process through which milk is squeezed out of milk-producing tissue by the action of the hormone oxytocin.

**Leukocyte**: White blood cell.

**Leukotriene**: Arachidonic acid metabolites, compounds that occur naturally in leukocytes and participate in inflammatory reactions.

**Liner slip**: Condition whereby the teat cups slide down the surface of the teat, allow air admission around the teat and are often accompanied by a squawk. They are caused by improper liner design, cluster weight, vacuum fluctuations, and milking wet teats.

**Lipase**: An enzyme that breaks down butterfat, leading to rancidity of milk.

**Lymphocyte**: A type of white blood cell involved in udder immunity.

**Macrophage**: A type of white blood cell that engulfs and destroys microorganisms in milk.

**Major histocompatibility complex**: A genetic region of chromosomes responsible for products that function in cell to cell communication.

**Mastitis**: Inflammation of the udder, most commonly caused by an infecting microorganism.

**Microorganism**: Small, one-celled or multicellular organisms that can only be viewed with a microscope.

**Milk tube or milk hose**: The tube that conveys milk from the claw or reservoir to a pipeline or bucket.
**Milking unit:** An assembly consisting of shells, inflation, claw, air and milk tubes, and pulsator.

**Milking vacuum:** The vacuum to which the teat of the cow is exposed when the inflation is open.

**Mycobacteria:** Slender, acid-fast microorganisms resembling the bacilli that cause diseases including tuberculosis and paratuberculosis.

**Mycoplasma:** Microorganisms that are intermediate in size between bacteria and viruses, and are lacking a true cell wall.

**Myoepithelial cells:** Elastic smooth muscle cells that surround alveolus and respond to oxytocin to contract and squeeze milk from the alveolus during milk ejection.

**Neutrophil:** A type of white blood cell that engulfs and destroys microorganisms in milk. The primary cell type in secretion from an inflamed mammary quarter.

**Nonbacterial mastitis:** A form of mammary inflammation in which no microorganisms can be isolated from milk samples.

**Opsonins:** Proteins that function by preparing microorganisms for engulfment (phagocytosis) by white blood cells.

**Oxytocin:** The hormone produced in the pituitary gland that causes milk let-down.

**Pathogen:** Any microorganism that causes disease.

**Phagocytosis:** The process by which white blood cells engulf microorganisms.

**Plasmin:** An enzyme that breaks down fibrin clots as well as milk casein.

**Polymorphonuclear neutrophilic leukocyte:** A type of white blood cell that engulfs and kills bacteria. Often abbreviated as PMN.

**Prevalence (of mastitis):** The percent of cows or mammary gland quarters that are infected at any one point in time.

**Pseudomonads:** Gram-negative, lactose negative, catalase-positive, motile, rod-shaped microorganisms.

**Pseudopodia:** Finger-like projections of leukocytes, which aid in the engulfment of bacteria.

**Pulsation rate:** Number of pulsation cycles per minute.
**Pulsation ratio**: The amount of time a pulsator creates vacuum to open the liner compared with the amount of time it admits air to collapse the liner.

**Pulsator**: A device that varies the vacuum (pressure) between the line and shell, thus opening and closing the liner to provide milk removal and massage to the teat.

**Rennet**: An enzyme that causes protein components in milk (casein) to precipitate (curd) and allows the liquid components to separate into whey.

**Scar tissue**: Fibrous tissue accumulating in the udder after infection that permanently replaces milk-producing tissue and prevents drugs from reaching sites of infection.

**Secretory epithelial cells**: Cells in the udder comprising an alveolus that synthesize and secrete milk.

**Serum albumin**: A blood protein that leaks into the mammary gland when inflamed.

**Somatic cells**: Includes mainly white blood cells that move into the udder during inflammation, and a small percentage of epithelial cells from milk producing tissues.

**Spontaneous recovery**: The ability of a cow to cure herself of an udder infection without the aid of antibiotics or other drugs.

**Staphylococci**: Spherical bacteria that grow in grape-like clusters.

**Stray voltage**: Small electrical currents on milking equipment originating on or off the farm, which may elicit a response from cows.

**Streptococci**: Spherical, Gram-positive bacteria that grow in chains.

**Strippings**: That portion of milk left in the udder after machine detachment.

**Subclinical mastitis**: The most prevalent form of udder inflammation. It cannot be detected visually but causes the greatest economic loss.

**Summer mastitis**: A form of mastitis characterized by thick, foul-smelling secretion (pus) usually caused by *Trueperella pyogenes* and *Peptococcus indolicus*.

**Teat canal**: Passageway through which milk flows from the udder. It is surrounded by a muscle sphincter that maintains tight closure between milkings.

**Teat cup crawl**: Movement of the teat cup up the teat as internal pressure in the udder drops during milking.

**Toxemia**: A condition caused by toxins or poisons that enter the bloodstream and cause illness.
Toxin: A poison produced by microorganisms that kills cells.

Vacuum pulsator line: The pipe or line that supplies vacuum to the pulsator(s).

Vacuum pump: A pump that removes air from the milking system to develop partial vacuum.

Walling-off: A condition in which microorganisms in the udder become enclosed (walled off) by scar tissue and are inaccessible to drugs.

Wet milking: The milking of teats that have not been thoroughly dried.

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