

DAIRY TECHNOLOGY E-LEARNING MODULE DESCRIPTORS

MILK PRODUCTION MODULE

1. The background of why milk is considered nature's most complete food (2 pages)
2. The Dairy Cow and the milk production cycle (8)
3. Milk production on the farm; feeding the dairy cow, farm assurance and the milking process (5)
4. Milk hygiene at the farm and the sources of contamination (6)
5. Milk distribution, the movement of milk from farms to dairy factories (5)

DAIRY CHEMISTRY MODULE

1. Milk: Components & structure (2)
2. Milk fat: Structure, fatty acids, milk fat globule membrane, milk fat chemistry (6)
3. Milk proteins: Structure, milk protein fractions, casein micelle, key reactions, whey protein types and properties (8)
4. Lactose: Structure, key reactions, lactic acid (3)
5. Minor components: Minerals, vitamins & enzymes (2)
6. Physical properties : density, freezing point, optical properties (4)

DAIRY MICROBIOLOGY MODULE

1. Micro-organisms & their importance in milk: micro-organisms occurrence in milk, roles of micro-organisms in milk (2)
2. Types of micro-organisms in milk: bacteria, yeasts, moulds, Viruses (incl bacteriophage) and protozoa and their characteristics (5)
3. Bacteria: naming, shapes and classification (4)
4. Bacterial reproduction & growth: binary fission, bacterial growth phases, factors influencing growth (7)
5. Bacteria in milk: Important groups – pathogens, *Enterobacteriaceae*, psychrotrophs, thermadurics and lactic acid bacteria (11)
6. Dairy plant hygiene: overview to control bacterial growth (1)

MILK PROCESSING MODULE

1. Fluid flow: milk flow in pipes (laminar & turbulent), critical velocities for milk, different pumps and valves and their uses. (5)
2. Heat processing: temperature/time combinations used for processing milk, plate heat exchanger structure and functioning, holding time calculation, process economics (heating, cooling, regeneration), pasteurisation (process flow & control, safety), pasteuriser monitor programme. (10)
3. Centrifugation: Fat separation, Stokes Law, centrifugal separation principles, fat standardisation. (6)
4. Homogenisation: mechanism, single & two stage homogenisation principles. (3)
5. Membrane processing: principles of reverse osmosis, nanofiltration, ultrafiltration and microfiltration, applications for membrane processing, membrane structure. (6)
6. A milk processing line: typical structure. (1)

MILK PRODUCTS MODULE

1. UK Milk utilisation, milk designations. (2)
2. Liquid milk processing: process & post process effects, ESL milk processing methods and shelflife, milk drinks composition and manufacture. (6)
3. Creams: different categories, legislation, processing parameters, composition and stability. (3)
4. Butter: legislation, varieties, manufacturing stages (continuous buttermaker), physio-chemical changes during spreadability. (5)
5. Cheese: definition and legislation, general cheesemaking steps, physio-chemical changes during manufacture, cheddar process line, maturation, product categories. (10)
6. Yogurt: Physio-chemical changes during manufacture, milk preparation and processing steps, cultures, yogurt types. (5)
7. Ice-cream: ingredients and manufacture (2)
8. Milk powders: manufacture, heat classification, main categories. (3)

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