Skilled Trades Ontario | Métiers spécialisés Ontario

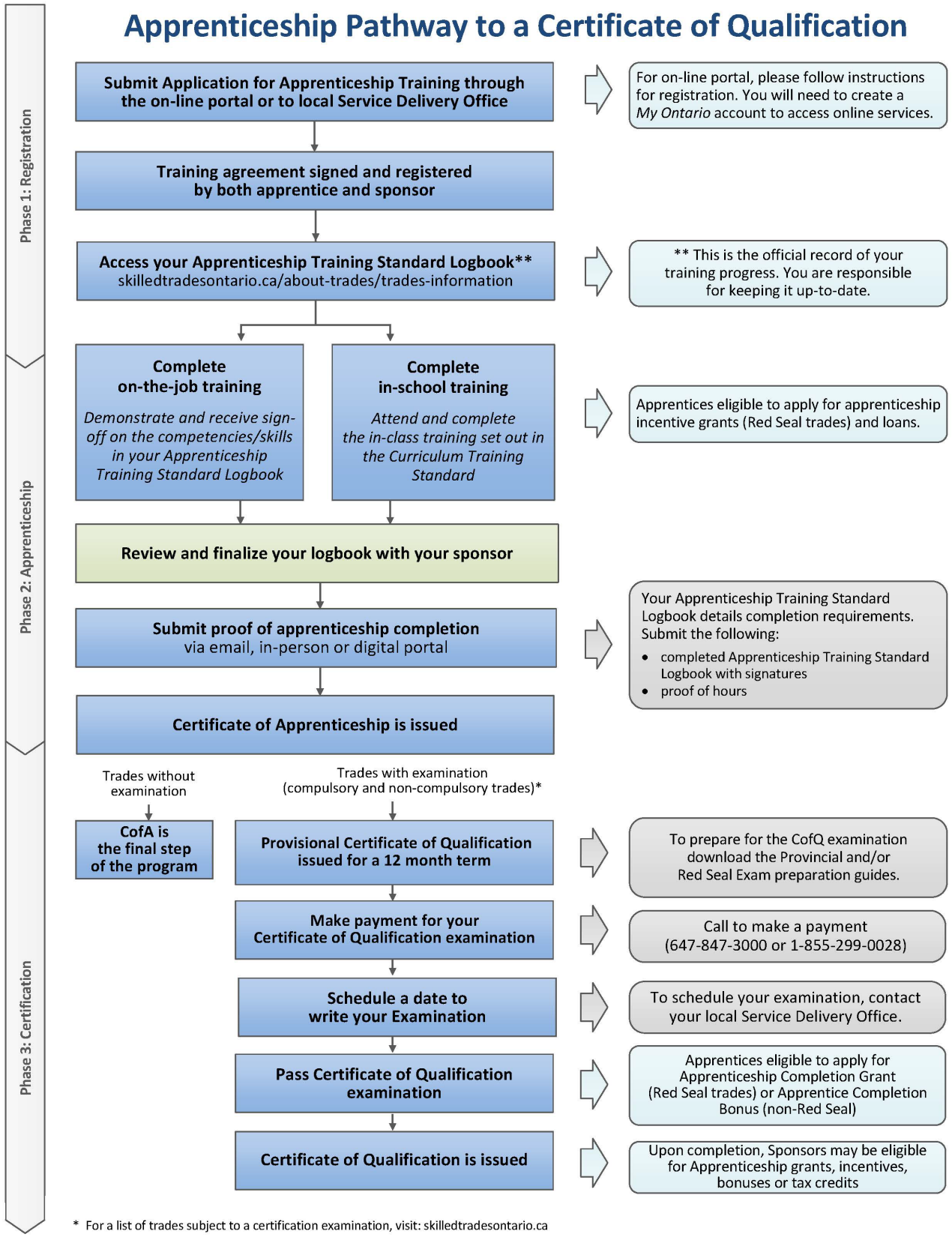
Apprenticeship Curriculum Standard

Agricultural — Dairy Herdsperson

640D

2010

Apprenticeship Pathway to a Certificate of Qualification



* For a list of trades subject to a certification examination, visit: skilledtradesontario.ca

Draft version: 2022-03-16

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Please Note: This Standard has been revised to reflect the visual identity of Skilled Trades Ontario (STO) which replaced the Ontario College of Trades on January 1, 2022. The content of this Standard may refer to the former organization; however, all trade specific information or content remains relevant and accurate based on the original date of publishing.

Please refer to STO's website: **skilledtradesontario.ca** for the most accurate and up to date information. For information about BOSTA and its regulations, please visit ***Building Opportunities in the Skilled Trades Act, 2021* (BOSTA).**

Any updates to this publication are available on-line; to download this document in PDF format, please follow the link: Skilled Trades Ontario.ca.

Maintained with transfer to Skilled Trades Ontario 2010 (V100)

Preface

This curriculum standard for the Agricultural - Dairy Herdsperson trade program is based upon the on-the-job performance objectives, located in the industry-approved training standard.

The curriculum is organized into 7 reportable subjects. The Reportable Subjects Summary chart (located on page 3) summarizes the training hours for each reportable subject.

The curriculum identifies the learning that takes place in-school. The in-school program focuses primarily on the theoretical knowledge and the essential skills required to support the performance objectives of the Apprenticeship Training Standards.

Employers/Sponsors are expected to extend the apprentice's knowledge and skills through practical training on a work site. Regular evaluations of the apprentice's knowledge and skills are conducted throughout training to verify that all apprentices have achieved the learning outcomes identified in the curriculum standard.

It is not the intent of the in-school curriculum to perfect on-the-job skills. The practical portion of the in-school program is used to reinforce theoretical knowledge. Skill training is provided on the job.

Please refer to Skilled Trades Ontario website (www.skilledtradesontario.ca) for the most accurate and up-to-date information about Skilled Trades Ontario. For information on *Building Opportunities in the Skilled Trades Act, 2021 (BOSTA)*) and its regulations, please visit Building Opportunities in the Skilled Trades Act, 2021, S.O. 2021, c. 28 - Bill 288 (ontario.ca)

Hours Disclaimer (if applicable)
It is agreed that Training Delivery Agents (TDAs) may need to make slight adjustments (with cause) according to particular apprentice needs and may deviate from the unit sequencing and the prescribed practical and theoretical hours shown within the standard. However, all TDAs will comply with the hours at the reportable subject level.

Suggested Equipment for Training Delivery Agencies
Personal and Safety Equipment: Personal protective equipment is at the discretion of the TDA who must conform to Ontario Provincial Health and Safety Regulations.

Agricultural — Dairy Herdsperson

Reportable Subject Summary

Number	Reportable Subjects	Hours Total	Hours Theory	Hours Practical
S0901	Applied Farm Practices	18	18	0
S0902	Milking Practices	117	96	21
S0903	Feeding Practices	111	96	15
S0904	Herd Health Maintenance	111	90	21
S0905	Routine Herd Maintenance	48	33	15
S0906	Farm Mechanical and Electrical Systems — Basic Maintenance	54	33	21
S0907	Farm Mechanical Equipment — Basic Maintenance	21	15	6
	Total	**480**	**381**	**99**

Number:	S0901	
Title:	**Applied Farm Practices**	
Duration:	Total Hours: 18	Theory: 18 Practical: 0
Prerequisites:	Grade 12	
Content:	S0901.1	Identify safety practices and legislation as applied to OHSA. (0.5/0 hrs)
	S0901.2	Identify required personal protective clothing and equipment. (0.5/0 hrs)
	S0901.3	Describe good housekeeping procedures for the classroom and work site. (0.5/0 hrs)
	S0901.4	Identify emergency response procedures. (0.5/0 hrs)
	S0901.5	Identify safe working procedures for working on farm. (0.5/0 hrs)
	S0901.6	Identify procedures for checking and inspecting equipment. (2/0 hrs)
	S0901.7	Describe procedures for reporting injuries. (0.5/0 hrs)
	S0901.8	Describe the initial response to injuries or accidents. (0.5/0 hrs)
	S0901.9	Identify safe work habits. (0.5/0 hrs)
	S0901.10	Identify safe procedures when handling pesticides, drugs, and medications. (1/0 hrs)
	S0901.11	Describe safety procedures when working around feed and storage systems. (1/0 hrs)
	S0901.12	Describe safety procedures when working with chemicals. (1/0 hrs)
	S0901.13	Identify pertinent employment standards for working on a farm. (2/0 hrs)
	S0901.14	Describe farm management practices. (6/0 hrs)
	S0901.15	Describe manure management practices. (1/0 hrs)

Evaluation & Testing: Assignments related to theory and application skills
Minimum of one mid-term test during the term
Final test at end of term
Periodic quizzes

Instructional and Delivery Strategies: Lecture
Video
Paper based material
Internet On-Line
Practical Projects

Reference Materials: OMAFRA Fact Sheets
Manufacturer's Manuals

Number:	S0901.1		
Title:	**Applied Farm Practices**		
Duration:	Total Hours: 18	Theory: 18	Practical: 0
Cross-Reference to Training Standards: U5380.0, U5381.0, U5382.0, U5383.0, U5384.0, U5385.0, U5386.0			

General Learning Outcomes

Upon successful completion the apprentice is able to identify and describe applied Farm Practices pertaining to Dairy Herdsperson.

Learning Outcomes and Content

1.1 Identify safety practices and legislation as applied to OHSA. (0.5/0 hrs)

Identify pertinent safety practices, recommendations, and legislation including:

- sound levels in decibels vs. duration in hours
- manufacturers' recommendations
- warning decals
- WMHIS
- Farming Operations
- liability and local bylaws
- environmental regulations

1.2 Identify required personal protective clothing and equipment. (0.5/0 hrs)

Identify personal protective equipment including:

- boots
- gloves
- eye protection
- ear protectors
- head protection
- UV protection sun screen
- respiratory

1.3 Describe good housekeeping procedures for the classroom and work site. (0.5/0 hrs)

1.4 Identify emergency response procedures. (0.5/0 hrs)

Identify emergency responses including:

- Fire Department
- Police
- Hospital
- Ambulance
- Poison Control
- smoke and heat detectors
- fire extinguishers
- environmental farm plan

1.5 Identify safe working procedures for working on farm. (0.5/0 hrs)

Identify safe procedures for working on farm including:

- safe work areas around machinery
- safe work areas around animals
- safety precautions around people
- fencing and barricades
- moving equipment
- flowing grain entrapment hazards
- confined space

1.6 Identify procedures for checking and inspecting equipment. (2/0 hrs)

Identify procedures for checking and inspecting equipment including:

- manufacturers' maintenance schedule
- locking out and tagging procedures
- OHSA recommendations
- Highway Traffic Act
- pre-operational check

1.7 Describe procedures for reporting injuries. (0.5/0 hrs)

Describe procedures for reporting injuries including:

- pertinent legislation
- reporting requirements

1.8 Describe the initial response to injuries or accidents. (0.5/0 hrs)

Describe the initial response to injuries or accidents including:

- identifying injury
- initial response procedures

1.9 Identify safe work habits. (0.5/0 hrs)

Identify safe work habits including:

- hoisting and rigging techniques
- lifting techniques
- handling of tools and equipment
- barricades and guards
- safe driving habits
- travelling on roadways
- passengers on moving vehicles
- good housekeeping
- wearing of protective equipment
- emergency response procedures

1.10 Identify safe procedures when handling pesticides, drugs, and medications. (1/0 hrs)

Identify safe procedures when handling pesticides, drugs, and medications including:

- pertinent legislation and regulations
- OHSA recommendations
- environmental requirements
- municipal bylaws
- hazard labels
- WHMIS labels
- workplace labels
- handling procedures
- protective equipment
- storage procedures
- veterinary prescriptions
- manufacturers' specifications
- prescription labelling

1.11 Describe safety procedures when working around feed and storage systems. (1/0 hrs)

Describe safety procedures when working around feed and storage systems including:

- gas formation and properties
- protective clothing
- safe entry into confined spaces
- warning signs
- dangerous situations
- ventilation of silo
- ventilation of feed room
- procedures for handling liquid

1.12 Describe safety procedures when working with chemicals. (1/0 hrs)

Describe safety procedures when working with chemicals including:

- liquid nitrogen
- formaldehyde
- copper sulphate
- chemical compounds
- storage
- handling
- transportation
- application
- personal protective equipment

1.13 Identify pertinent employment standards for working on a farm. (2/0 hrs)

1.14 Describe farm management practices. (6/0 hrs)

Describe farm management practices including:

- nutrition plan
- working with people
- record keeping
- reporting procedures

1.15 Describe manure management practices. (1/0 hrs)

Describe manure organic composition, nutrient value of manure, manure removal systems and spreading systems including:

- N, P, K levels in manure
  - effects of treatment on manure levels
- hazardous manure gases
- solid manure handling systems
- liquid manure handling systems

Describe environmental requirements and protocols for manure removal and spreading including:

- time of spreading
- application rates
- best practices

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
100%	0%	100%

Number:	S0902		
Title:	**Milking Practices**		
Duration:	Total Hours: 117	Theory: 96	Practical: 21
Prerequisites:	Grade 12		
Content:	S0902.1	Identify safe work habits when performing milking procedures. (3/0 hrs)	
	S0902.2	Describe milking procedures. (16/7 hrs)	
	S0902.3	Describe the assembly and start-up procedures of milking system. (7/3 hrs)	
	S0902.4	Describe conditions for cows that are to be alternatively milked. (6/0 hrs)	
	S0902.5	Describe routine milking procedures. (9/2 hrs)	
	S0902.6	Describe monitoring procedures during the milking process. (8/0 hrs)	
	S0902.7	Describe factors that influence milk production fluctuations and monitoring procedures. (10/3 hrs)	
	S0902.8	Describe procedures for disassembling and shutting down a milking system. (8/2 hrs)	
	S0902.9	Describe post-dip procedures. (5/1 hrs)	
	S0902.10	Describe the procedures for the alternative milking of fresh and treated cows. (5/1 hrs)	
	S0902.11	Describe procedures for cleaning and sanitization of milking equipment. (6/1 hrs)	
	S0902.12	Describe factors/indicators that affect milk outputs. (6/1 hrs)	
	S0902.13	Describe the impact of organics on milking theory and procedures. (4/0 hrs)	

Evaluation & Testing: Assignments related to theory and application skills
Minimum of one mid-term test during the term
Final test at end of term
Periodic quizzes

Instructional and Delivery Strategies: Lecture
Video
Paper based material
Internet On-Line
Practical Projects

Reference Materials: OMAFRA Fact Sheets
Manufacturer's Manuals

Number:	S0902.1		
Title:	**Milking Practices**		
Duration:	Total Hours: 117	Theory: 96	Practical:21
Cross-Reference to Training Standards: U5380.0, U5381.0, U5385.0			

General Learning Outcome

When successfully completed, the apprentice will demonstrate the ability to identify, describe, and document milking procedures and methods.

Learning Content

2.1 Identify safe work habits when performing milking procedures. (3/0 hrs)

Identify safe work habits when performing milking procedures including:

- safety hazards
- cleaning solutions
- medications
- treatments
- safe work habits

2.2 Describe milking procedures. (16/7 hrs)

Describe procedures for milking animal preparation including:

- individual wash and dry papers or cloths
- pre-dipping and drying
  - individual papers
  - cloths
  - Minnesota “one-step”
- fore-stripping

Describe milk let-down sequences including:

- washing
  - fore-stripping
  - drying
- fore-stripping
  - pre-dipping
  - drying
- pre-dipping
  - manual manipulation
- fore-stripping drying

Describe the functions of a milking system including:

- airflow
  - vacuum pump capacity
  - manual reserve
  - effective reserve
  - air admission
  - vacuum regulator
  - maintenance
- vacuum
  - system vacuum
  - digital vacuum gauge
  - mercury column
  - claw vacuum
  - cyclic
  - irregular
  - friction
  - milk lift
  - maintenance
- pulsation
  - simultaneous
  - alternating
  - pneumatic
  - electromagnetic
  - rate
  - ratios
  - milk phase
  - rest phase
  - liner
  - bore
  - composition
  - maintenance

Describe components of a milking system including:

- vacuum pump
- vacuum relief valve
- vacuum shut-off valve
- airflow test port

- vacuum test port
- air filter
  - moisture trap
- main air line
- distribution
  - tank
  - balance
- pulsation airline
  - pulsation header line
- main vacuum supply line
- sanitary (moisture) trap
- receiver
- milk line
  - slope
  - inlets
- vacuum gauge
- releaser milk pump
- milk filter
- milk transfer line
- bulk milk tank
- wash line
- air injector
  - continuous air bleed
  - electronic
  - mechanical
- diverter valve
- wash sink
- wash manifold
- automatic washer
  - pipeline
  - bulk tank
- cluster (milking unit)
  - claw
  - air vent
  - claw vent
  - inflation vents
  - shut-off valve
  - teat cup
  - shell
  - liner (inflation)
  - short milk tube

    - short pulse tube
    - long pulsation hose
    - milk hose
    - hose canes
    - hooks
- pulsator
- ancillary equipment
    - plate coolers
    - heat exchanger
    - automatic detachments
    - filtered air line
    - weigh jars
    - trap pail(s)
    - end of milk indicators
    - mastitis indicators
    - screens
    - conductivity
- milk meters
    - parlor
    - tie-stall
- robotics

Describe the physiological processes of milk “let-down” including:

- alveoli
- hormones
    - oxytocin
    - adrenalin
- stimulation

Identify pertinent Milk Act Regulations.

2.3 Describe the assembly and start-up procedures of a milking system. (7/3 hrs)

Describe the function of a milking system including:

- airflow
    - reserve
    - air admissions
- milk flow
    - slugs
    - flooding

Describe the milking system components including:

- diverter valves
- micro-switch
  - safety switch
- transfer line
- milk filter

Describe routine inspection of system components including:

- rubber parts
  - milk hoses
  - gaskets
  - inflations (liners)
- milk stone/water stone
- build-ups
  - milk lines
  - receiver
  - probes
- plate coolers
  - cleanliness

Describe the milk cooling system including:

- compressors
  - ventilation
  - maintenance
- heat recovery (storage and use of water)
- plate coolers (use of water)
- chillers
- time temperature recorder (TTR)

2.4 Describe conditions for cows that are to be alternatively milked. (6/0 hrs)

Describe recording procedures for conditions on dry and milking cows including:

- clinical mastitis incidence
  - drug withdrawals
- dry cow treatments
  - drug withdrawals
  - post calving
- veterinary prescriptions

Identify procedures for the segregation of dry cows from the milking herd including:

- records
- leg bands
- markers
- separate housing
- electronic identifiers

Identify procedures for treated cows to be alternatively milked including:

- records
- leg bands
- markers
- separate housing
  - end of row
  - hospital pen
- signs
- chalk board
- communication
- obstruction to milking
  - inlet
  - pulsation stall cock
  - automatic sorting gates
  - electronic identifiers

Identify procedures for clinical cows (not treated) that need to be alternatively milked including:

- records
- markers
- leg bands
- notification procedures
- strip cup
- CMT paddle

Describe the set-up of an alternative milking unit including:

- trap pail
  - hoses
  - claw
- individual milker pail
  - claw
  - pulsator
- robotic
  - diversion
  - flushing

Describe disinfection procedures of a milking unit prior to milking a fresh cow, when using a unit that had previously milked other cows including:

- pre-rinse
- sanitize
  - chlorine
  - iodine
  - water temperatures
- post-rinse
- drying
- back flushing
- contact time

Describe symptoms of conditions that require alternative milking including:

- mastitis
  - clots
  - thick milk
  - watery milk
- bloody milk
- treatments with antibiotics
- contagious infected cow
  - staph aureus
  - strep ag
  - mycoplasma

Identify pertinent Milk Act Regulations.

2.5 Describe routine milking procedures. (9/2 hrs)

Describe pre-milking procedures including:

- udder wash
  - product choices
  - compatibility
  - solution strength
- teat dip
  - product choices
  - formulations
  - Health Canada DIN #,
  - NMC Protocols
- individual wipes
  - dairy towels
  - newspaper
  - sani-wipes
  - cloths
- hand washing
  - nitrile gloves
  - latex gloves

Describe washing and drying procedures including:

- wet paper/cloth and sanitizer
  - teats
  - teat ends
- individual paper/cloth
  - teats
  - teat ends
- stimulation

Describe pre-stripping protocols including:

- tie stall
  - into a strip cup
- parlour
  - into a strip cup
  - on to floor
- sequencing
  - wash/strip/dry
  - strip/pre-dip/dry
  - pre-dip/strip (with gloved hand)/dry

Describe symptoms of abnormal or mastitic milk including:

- fore-stripping
  - flakes
  - clots
  - blood
  - watery
- California Mastitis Test (MST)

Describe the completion of clinical mastitis documentation including:

- calendar
- chalkboard/white board
- permanent record
- individual cow identification
- computer records

Describe pre-dipping protocols including:

- hand
  - paper wipe
  - fore-stripping
  - pre-dip
  - dip cup
  - coverage
  - contact time
  - product
- drying
  - method
  - (residue)
- stimulation

Identify milking unit attachments including:

- unit attachment lag time
- air admission
- alignment
- “S” pattern of inflation

Describe unit alignments and adjustments to promote effective milk-out and prevent/minimize liner (inflation) slippage including:

- milk hose alignment
- alignment
  - hooks
  - arms
- weight distribution

Describe milk let-down and milk completion procedures including:

- oxytocin
- adrenalin
- milk-out
- unit removal
  - air admission
  - shut-off valves
  - automatic detachers

2.6 Describe monitoring procedures during the milking process. (8/0 hrs)

Describe alignment of milking units including:

- milk hose position
- tension
- tie-stall
- parlour
- robotics

Identify corrective actions to be taken throughout the milking process including:

- adjustment
- replacement

Describe monitoring procedures for the system vacuum level at start-up and from time to time during the milking process including:

- gauge

Describe auditory monitoring procedures for the pulsation performance

- beat

Describe how to check for twisted inflations in the shells including:

- one-piece inflations
  - alignment marks
- two-piece inflations
  - visual

Describe how to check claw or inflation air vents including:

- open (audible)
- clean

Describe how to check milk flow through pre-coolers and into bulk milk tanks including:

- visual
- recommend adjustments

2.7 Describe factors that influence milk production fluctuations and monitoring procedures. (10/3 hrs)

Describe illness symptoms that affect individual cow milk production including:

- physiological
- metabolic

Describe environmental factors that affect milk production including:

- ventilation
  - temperature
  - humidity
- housing comfort
- monitoring requirements

Describe physiological factors that affect milk production including:

- mastitis
- oestrus
- foot rot
- lameness
- udder edema
- milk fever
- teat injury
- ketosis

Interpret milk production and somatic cell count SCC data from milk recording service reports including:

- production
  - daily
  - per lactation
  - fat
  - protein
- Somatic Cell Court (SCC)
  - linear score
  - SCC average
  - % > 200,000 cells/ml
- days in milk (DIM)

Describe documentation procedures including:

- clinical records
- inhibitor protocols - drug use, withdrawals
- veterinary prescriptions
- milk culture reports
- drug sensitivity report

Describe mechanical factors that affects milk production including:

- airflow
- vacuum level
- regulator malfunction
- pulsation
- inflation (liner)

Identify pertinent Milk Act Regulations and recommendations.

2.8 Describe procedures for disassembling and shutting down a milking system. (8/2 hrs)

Describe milking-out procedures including:

- automatic take-off setting
- end-of-milk indicators
- visual
- verification check

Describe unit removal from the cow and from the milking system including:

- positive vacuum shut-off
- claw vacuum decay time
- machine stripping

Describe manual or automatic removal of milking equipment including:

- air bleeds
  - claw
  - inflation
- automatic detachers
  - delay
  - decay
  - cord
  - arms

2.9 Describe post-dip procedures. (5/1 hrs)

Describe post teat-dipping procedures including:

- dipping
- spraying
  - coverage
- product

Describe “cold” weather post teat-dipping procedures including:

- coverage
- contact time
- blotting
- powders
- drying agents

Describe post milking dip including:

- iodine
- chlorohexadine
- formulations
- germicides
- barriers
- sealants
- conditioners

Identify pertinent regulations and recommendations.

2.10 Describe the procedures for the alternative milking of fresh and treated cows. (5/1 hrs)

Identify pertinent Milk Act Regulations including:

- saleable milk
- inhibitors

Describe alternative milking procedures including:

- regular unit
  - with trap pail
  - end of milking
- fresh cow
  - first with trap
  - last with disinfected unit
- treated cow
  - last
  - transfer pipe out of bulk tank
- spare unit
  - claw

Describe alternative milking equipment components including:

- trap pail
- extra claw

Describe methods for discarding or utilizing alternative milk including:

- disposal procedures
- calf feeding

Describe the completion of alternative milking documentation including:

- records
  - cow number
  - quarter(s)
  - drug
  - withdrawals

Describe various inhibitor tests.

2.11 Describe procedures for the cleaning and sanitizing of milking equipment. (6/1 hrs)

Identify pertinent Milk Act Regulations for cleaning and sanitizing milking equipment including:

- cleaning solutions
- sanitizing solutions
- residues

Describe pre-wash rinsing of milking equipment including:

- water temperature
  - start
  - end
- diversion - disposal
- duration

Describe the wash and rinse cycles of both milking systems and bulk tanks including:

- wash
  - temperature - start and end of cycle
  - solution strength - pH, alkalinity
  - circulation
  - duration
- acid rinse (pH, duration)

Describe the use of cleaning solutions and methods including:

- automatic
  - clean in place (CIP)
  - chlorine
  - alkalinity
  - acid pH
- manual

Describe monitoring procedures for the mechanical function of cleaning systems including:

- air injection
  - electronic
  - mechanical
- air bleed
- sink volume
- slug velocity
- slug size
- line slope
- visual

Describe monitoring procedures for temperatures of solutions. Describe sanitizing procedures including:

- chlorine (strength)
- iodine (strength)
- 20 - 30 minutes prior to milking
- drainage

Describe storage and handling procedures including:

- labeling
- containers (4 litres, 20 litres, bulk)
- acid versus chlorine precautions

Complete pertinent documentation including:

- records
- order forms
- inventory

Describe all abnormal conditions pertaining to system cleaning including:

- residues
- build-ups
- aborted cycles
- malfunctions
- trapping out
- robotics

2.12 Describe factors/indicators that affect milk outputs. (6/1 hrs)

Identify signs/symptoms of abnormal milk including:

- clots
- flakes
- bloody
- colostrums
- smell
- appearance
- flavours

Identify signs/symptoms of abnormal cleaning including:

- films
- residues
- protein
- temperature

Describe physiological factors including:

- mastitis
- lameness
- foot rot
- oestrus
- edema
- teat/udder injury

Describe environmental factors including:

- ventilation
- cow comfort
- manure contamination
- bedding material
- stall

Describe mechanical factors including:

- airflow
- vacuum
- pulsation
- regulator malfunction
- robotics

Describe the completion of documentation including:

- clinical records
- antibiotic use
  - lactation
  - dry off
- journal
- computer records

Interpret milk production records including:

- Dairy Herd Improvement (DHI)
- bulk milk weight/volume records
- protein
- fat
- solids non fat (SNF)
- milk urea nitrogen (mun)

Interpret milk quality records including:

- SCC
- cultures
- inhibitor
  - residue
- quality
  - bacto scan (BSN)
  - freezing point
  - sediment

Interpret pertinent regulations and recommendations.

2.13 Describe the impact of organics on milking theory and procedures. (4/0 hrs)

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
82%	18%	100%

Number:	S0903		
Title:	**Feeding Practices**		
Duration:	Total Hours: 111	Theory: 96	Practical: 15
Prerequisites:	Grade 12		
Content:	S0903.1	Identify safe work habits when performing feeding procedures. (3/0 hrs)	
	S0903.2	Describe feeding methods and procedures. (8/1 hrs)	
	S0903.3	Describe procedures for calculating quantities and ratios of feed. (8/2 hrs)	
	S0903.4	Describe procedures for the testing of feed mix. (7/2 hrs)	
	S0903.5	Describe the operations and functions of a feeding system. (16/3 hrs)	
	S0903.6	Describe factors that indicate off-feed or low-feed intake. (14/2 hrs)	
	S0903.7	Describe factors that indicate water intakes. (15/2 hrs)	
	S0903.8	Describe the procedures and methods for the cleaning and maintaining of feeding mangers and feeders. (7/2 hrs)	
	S0903.9	Describe feed mix additives. (9/1 hrs)	
	S0903.10	Describe inventory control procedures. (9/0 hrs)	

Evaluation & Testing:
Assignments related to theory and application skills
Minimum of one mid-term test during the term
Final test at end of term
Periodic quizzes

Instructional and Delivery Strategies:
Lecture
Video
Paper based material
Internet On-Line
Practical Projects

Reference Materials:
OMAFRA Fact Sheets
Manufacturer’s Manuals

Number:	S0903.1		
Title:	**Feeding Practices**		
Duration:	Total Hours: 111	Theory: 96	Practical:15
Cross-Reference to Training Standards: U5380.0, U5382.0, U5385.0			

General Learning Outcome

Upon successful completion, the apprentice is able to identify, describe, and document feeding procedures and methods.

Learning Content

3.1 Identify safe work habits performing feeding procedures. (3/0 hrs)

Describe safe work habits required when performing feeding procedures including:

- feeding animals
- feeding systems
- medicated feeds
- protective clothing and gear
- good housekeeping

3.2 Describe feeding method and procedures. (8/1 hrs)

Describe the feeding process including:

- ingredients
- number of different ration, groups, mixes
- feeding frequency
- feeding sequence

Identify nutritional recommendations including:

- animal
- age
- stage
- status
- mixing time Interpret feed sheets.

3.3 Describe procedures for calculating quantities and ratios of feeds. (8/2 hrs)

Identify quantities of feed mix by:

- calculating feed quantities
- listing amounts of feed

Identify ratios of feed mix by:

- calculate ratios of feed mix.
- list required ratios.

Describe procedures for the completion of documentation.

3.4 Describe procedures for the testing of feed mix. (7/2 hrs)

Identify feed moulds and contaminants including:

- weeds
- dust particles
- manure residues
- foreign object
- moulds
- mycotoxins
- heated silage
- improper fermentation

Describe feed testing and sampling procedures including:

- sampling protocol
- type of feed
- analysis required
- bulk ingredients
- total mixed ration (TMR)
- grain (wet/dry)
- forages (wet/dry)
- round or square bales
- silage
- supplements
- by-products

Identify feed types and mix including:

- forages
  - hay
  - quality/composition
    - grass
    - legumes
  - silage
  - quality/composition grass
- energy source feed
  - grain
    - corn
    - barley
    - wheat
    - oat
  - fat
    - Rumen by-pass
    - tallow
    - oil
    - commodities
  - wheat
    - short
    - corn starch
    - middling
    - beet pulp
- protein source feed
  - soybean
    - whole
    - meal
    - micronized
    - roasted
    - extruded
  - meal
    - canola
    - cotton seed
    - fish
    - corn gluten
- minerals
- salts
- supplements

Describe procedures for the completion of documentation.

3.5 Describe the operations and functions of a feeding system. (16/3 hrs)

Describe functions and operations of a feeding system including:

- silo
- load/unloader feed transfer system and equipment
- forage handling equipment
- round bale unroller
- silage block cutter
- bins
- auger, rigid/flex
- conveyor
- proportioner
- weighing device
- feed mill
- roller
- feed bunk
- parlour feeder
- computerized feeding stall
- TMR mixer
- mixing time
- ingredient inclusion and order
- manger
- automated feed distributor
- feed carts
- start-up
- shut-down

Describe functions and operational principles of feed system controls including:

- control panels
- control switches
- relays
- display monitors
- light indicators
- micro-switches

Describe procedures for the completion of documentation.

3.6 Describe factors that indicate off-feed or low-feed intake. (14/2 hrs)

Describe pertinent nutritional recommendations including:

- feed guides
- age
- weight
- breed
- production level
- feed types
- water availability
- dry matter of total ration
- production level

Describe factors that affect off-feed or low-feed intake including:

- production level
- frequency of feeding
- sequence of feeding
- type of ration
- quality of ration
- freshness of ration
- cleanliness of manger/bunk
- water availability
- dry matter of total ration
- stability of ration
- consistency of ration

Describe monitoring and recording procedures including:

- manure output
- bunk/manger feed levels
- cow mobility
- body condition

Describe remedies or corrective actions or off-feed or low feed intake.
Describe procedures for the completion of documentation.

3.7 Describe factors that indicate water intakes. (15/2 hrs)

Identify feeding/watering guide recommendations including:

- water consumption standard
  - animal type
  - age
  - level of production
- rate of flow in watering system for optimum production
- watering system for optimum production
- relationship between water and feed intake Describe pertinent nutritional recommendations. Describe monitoring and recording procedures.

Describe factors or indicators that affect water intake including:

- ration components
- production status
- rate of flow
- watering availability
- stray voltage
- water quality
- water temperature

Describe procedures for the completion of documentation.

3.8 Describe the procedures and methods for the cleaning and maintaining of feeding mangers and feeders. (7/2 Hrs)

Describe procedures for preparing a schedule of maintenance for equipment using manufacturers' documentation.

Describe cleaning methods and procedures including:

- high pressure washing
- cleaning products
- disinfectants

Describe procedures for the completion of documentation.

3.9 Describe feed mix additives. (9/1 hrs)

Identify type of additives including:

- supplements
- micronutrients
- medications

Identify nutritionist recommendations or veterinarian prescriptions. Describe incorporation of feed additives including:

- weighing
- measuring
- calculating
- mixing procedures
  - uniform dispersion
  - dosage
- calibration of equipment
- sampling of ration
- cleaning of equipment

Describe procedures for the completion of required documentation.

3.10 Describe inventory control procedures. (9/0 hrs)

Describe feed inventory control procedures including:

- recording
- documenting
- computerized feed inventory system
- inventory template
- feed consumption comparison
  - weekly
  - monthly
  - annual
- storage content calculations
  - forage
  - grain
- compare inventory with feeding program

Describe the preparation of a feed order including:

- calculating required feed
- time schedules
- feeding program
- consumption

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
86%	14%	100%

Number:	S0904	
Title:	**Herd Health Maintenance Theory and Procedures**	
Duration:	Total Hours: 111	Theory: 90 Practical: 21
Prerequisites:	Grade 12	
Content:	S0904.1	Identify safe work habits when performing herd health maintenance procedures. (3/0 hrs)
	S0904.2	Describe the principles of animal health. (9/3 hrs)
	S0904.3	Describe the symptoms and recommended treatments for unwell animals. (8/3 hrs)
	S0904.4	Describe the symptoms and recommended treatments for udder infections or injuries. (7/2 hrs)
	S0904.5	Describe methods for the use of antibiotics for the treatment of disease in cattle. (9/2 hrs)
	S0904.6	Describe the symptoms and recommended treatments for cow mobility problems. (7/1 hrs)
	S0904.7	Describe the symptoms and recommended treatments for cow respiratory problems. (8/3 hrs)
	S0904.8	Describe the symptoms and recommended treatments for abnormal skin conditions. (7/1 hrs)
	S0904.9	Describe the symptoms and recommended treatments for metabolic disease. (9/2 hrs)
	S0904.10	Describe the symptoms and recommended treatments for gastro-intestinal nematodes (worms). (4/1 hrs)
	S0904.11	Describe routine herd health procedures. (6/0 hrs)
	S0904.12	Describe reproductive health/cycles. (13/3 hrs)

Evaluation & Testing: Assignments related to theory and application skills
Minimum of one mid-term test during the term
Final test at end of term
Periodic quizzes

Instructional and Delivery Strategies: Lecture
Video
Paper based material
Internet On-Line
Practical Projects

Reference Materials: OMAFRA Fact Sheets
Manufacturer's Manuals

Number:	S0904.1		
Title:	**Herd Health Maintenance Theory and Procedures**		
Duration:	Total Hours: 111	Theory: 90	Practical:21
Cross-Reference to Training Standards: U5380.0, U5383.0, U5385.0			

General Learning Outcome

Upon successful completion, the apprentice is able to identify, describe, and demonstrate herd health maintenance procedures.

Learning Content

4.1 Identify safe work habits when performing herd health maintenance procedures. (3/0 hrs)

Identify required safe work habits when performing herd health maintenance procedures including:

- herd health procedures
- cleaning solutions
- medications
- treatments
- safe work habits
- protective clothing and gear
- good housekeeping

4.2 Describe the principles of animal health. (9/3 hrs)

Describe the principles of animal health including:

- infectious or non-infectious
- common organious
  - bacteria
  - viral
  - protozoa
  - fungi
- methods of transmission
  - infectious versus contagious
  - reservoir
  - direct versus indirect
- biosecurity
- end points

Describe outcomes for down or off-feed animals including:

- recovery
- shipping
  - legislation
  - humane shipping
- euthanasia
- chronics

4.3 Describe the symptoms and recommended treatments for unwell animals. (8/3 hrs)

Describe a healthy cow including:

- general attitude
  - bright
  - alert
  - dull
  - depressed
- body temperature
- respiratory system
  - rate
  - nasal discharge
  - lung sounds
- digestive system
  - eating
  - manure
  - rumen contractions
- cardiovascular
  - heart rate
  - pulse
  - mucous membrane colour
- reproductive
  - oestrous cycle
  - discharges
- mammary
  - texture
  - teat number and placement
  - milk quality

- musculoskeletal
  - movement
  - body condition
- nervous system
  - pupillary light response
  - behaviour

Describe a physical examination of a cow including:

- observation of attitude and behaviour
- temperature
- lungs
- rumen contraction
- heart
- mucous membrane colour
- evaluate pupillary light response
- udder
- California Mastitis test (CMT) and strip cup
- ancillary test
- ketone
- progesterone assay
- blood

Describe the symptoms of infectious disease that may cause an animal to be down or off-feed including:

- disease
  - bacteria
  - viruses
  - protozoa
- pneumonia
- uterine infections
- scours
- toxic mastitis
- listeriosis

Describe the symptoms of metabolic disorders that can cause an animal to be down or off-feed including:

- milk fever
- ketosis
- grass tetany
- grain overload
- bloating

Describe physical injuries that can cause an animal to be down or off-feed including:

- sciatic nerve damage
- hardware
- broken bones

Describe methods of detecting/identifying symptoms of down or off-feed animals including:

- physical evaluation
- rectal temperature
- stomach tube
- anxillary tests

Describe recommended treatments for down or off-feed animals including:

- early detection
- nursing
- feed
- bedding
- NSAIDs non-steroidal anti-inflammatory drugs
- steroids
- rumen stimulants
- propellant glycol
- rational use of antibiotics
- anti-bloating agents
- lifting animals
- rumen stimulants
- transfaunation

4.4 Describe the symptoms and recommended treatments for udder infections or injuries. (7/2 hrs)

Describe a healthy cow and a physical evaluation of a cow. Describe the causes of inflammation of the udder including:

- mastitis
- bacteria
- yeast
- injury
- organism transmission
  - contagious
  - environmental

Describe the symptoms of mastitis including:

- physical changes in the udder
  - heat
  - swollen
  - hardness
- changes in milk characteristics
  - watery
  - clumps
  - presence of blood
- systemic effects
  - fever
  - off feed
  - shock

Describe signs of physical injury including:

- teat laceration
- crushed teat
- laceration of udder skin
- polyps
- teat end extrusion

Describe methods of detecting or identifying symptoms of udder infections or disease including:

- somatic cell count (SCC)
- California Mastitis Test (CMT)
- sample taking
- culture of samples
- on-farm culture
- conductivity

Describe treatment of mastitis including:

- rational use of antibiotics
- intra-mammary infusions
- milking-out
- oxytocin
- dry cow treatment
- withdrawal times for milk
- aseptic techniques
- acute coliform mastitis
- partial vs. full insertion on intra-mammary infusion tubes
- assessment techniques of treatments
- homeopathy

Describe treatment protocols for injury to the udder including:

- intra-mammary devices
- stitches
- topical antibiotics and sprays
- veterinary intervention

Describe procedures for the completion of documentation including:

- clinical case information
- treatment administered
- number of treatments
- withdrawal times
- success rate
- recurrence rate

Describe methods for the prevention of mastitis including:

- biosecurity
- dry cow treatment
- teat sealants
- preparation for milking
- milking techniques
- teat dipping
- segregation of mastitic cows
- heifer management
- vaccination
- calving management

4.5 Describe methods for the use of antibiotics for the treatment of disease in cattle. (9/2 hrs)

Identify the use of antibiotics including:

- fever
- suspected bacterial infection
- previous similar case
- veterinary advice
- prevention of secondary infections
- blood in manure
- medicated feeds in young animals

Interpret label indications of an antibiotic including:

- class of animals
- dosage
- route of administration
- length of treatment
- withdrawal times
- warnings
- hazards

Identify extra-label use of an antibiotic including:

- extra label use
- who can legally prescribe extra-label use
- who is responsible for ensuring food safety after extra-label use
- what effect does extra-label use have on withdrawal times

Identify methods for antibiotic residues detection and the results of violative residue including:

- legal limits
- manufacturer’s responsibility
- cow-side tests
- bulk tank and tanker truck testing
- penalties for violative residues
- what occurs after a violative residue
- prevention of residues in food

4.6 Describe the symptoms and recommended treatments for cow mobility problems. (7/1 hrs)

Describe a healthy cow and a physical evaluation of a cow.

Describe the structure and function of the normal bovine foot including:

- bones
- heel
- hoof wall
- laminae
- sole
- white line
- weight bearing surfaces

Identify conditions that cause cattle to become lame including:

- foot rot
- strawberry heel
- sole ulcer
- laminitis
- sand cracks
- congenital deformities
- stones
- sprains
- overgrowth of claw
- swollen joints
- injury to hip or shoulder

Describe methods for detecting and identifying symptoms that cause lameness in cattle including:

- types of restraint
- lifting the foot
- which foot is lame
- use of hoof knife
- examination of the foot

Describe remedies, medications and treatments for lameness including:

- principles of hoof trimming
- bandaging
- foot baths
- rational use of antibiotics
- blocks
- boots
- veterinary intervention

4.7 Describe the symptoms and recommended treatments for cow respiratory problems. (8/3 hrs)

Describe a healthy cow and a physical evaluation of a cow. Identify causes of cow respiratory problems including:

- anatomy of the respiratory tract
- infectious problems
  - viral
  - IBR
  - PI3
  - BRSV
  - BVD
- bacterial
  - manheimen
  - hemophillus
  - lung worms
- non-infectious causes
  - irritant
  - obstruction
  - noxious plants

Describe the symptoms of respiratory problems including:

- history
  - age of onset
  - vaccination status
  - new imports
- change in body temperature
- change in respiratory rate
- lung sounds

- mucous discharge
- additional clinical signs
  - nasal plaques
  - abortion
  - general attitude
  - irritation of eyes

Identify methods of detecting or identifying symptoms of cow respiratory problems including:

- observation of animals
- normal versus unwell
- thermometer
- stethoscope
- ancillary tests

Describe treatments for respiratory problems including:

- rational use of antibiotics
- nursing
- isolation
- feed
- bedding
- NSAIDs (Non-steroidal anti-inflammatory drugs)
- steroids
- rumen stimulants
- propylene glycol

Identify methods of prevention of respiratory problems in cattle including:

- biosecurity
- vaccination protocols
- importing new animals
  - isolation
  - testing
  - physical examination
- housing
- ventilation
- general recommendations

Describe the completion of required documentation including:

- clinical case information
- cow health record
- treatment administered
- success rate
- recurrence rate

4.8 Describe the symptoms and recommended treatments for abnormal skin conditions. (7/1 hrs)

Describe a healthy cow and a physical evaluation of a cow. Describe the causes of abnormal skin conditions in cattle including:

- normal anatomy of the skin
- infectious
  - fungal
  - bacterial
  - mites
- nutritional deficiencies
- physical damage

Identify symptoms of abnormal skin conditions including:

- hair loss
- scales
- itchy
- scabs
- pustule

Describe methods of detecting or identifying symptoms of abnormal skin conditions including:

- physical examination
- skin scrapings
- skin biopsy

Describe treatments for abnormal skin conditions including:

- rational use of anti-parasitic compounds
- topical treatments
- nutritional supplementation
- homeopathy

Identify methods for the prevention of abnormal skin conditions in cattle including:

- biosecurity
- parasite control protocols
- new arrivals
- balanced rations
- housing
- sanitation

4.9 Describe the symptoms and recommended treatments for metabolic diseases. (9/2 hrs)

Describe a healthy cow and a physical evaluation of a cow. Describe the causes or symptoms of metabolic diseases including:

- milk fever
- ketosis
- grass tetany
- grain overload
- bloating

Describe the treatments for metabolic diseases including:

- IV glucose
- calcium administration
- steroids
- anti-foaming agents
- stomach tube
- hydration therapy
- transfaunation

Identify prevention methods for metabolic diseases including:

- balanced rations
- feeding practices
- ionophores
- transition cow management

4.10 Describe the symptoms and recommended treatments for gastro- intestinal nematodes (worms). (4/1 hrs)

Describe a healthy cow and a physical evaluation of a cow. Describe the life cycle of worms/GINs including:

- abomasal
- lung
- intestinal

Identify the symptoms of worms/GINs including:

- poor doer
- skin coat
- diarrhoea
- fecal floatation

Describe the treatment and prevention of worms/GINs including:

- rational use of de-wormers
- pasture management
- cleanliness
- organic treatments

4.11 Describe routine herd health procedures. (6/0 hrs)

Describe a herd health program including:

- preventative medicine vs. emergency
- organization and timing of procedures
- involvement
- roles and responsibilities
- profitability

Identify the major components of a herd health program including:

- vaccines
- de-worming of cattle
- regular hoof trimming
- reproductive management
- grouping of animals
  - age
  - size
  - sex
  - production level

- federal health program
- mastitis control
- ration changes
- monitoring procedures

Describe methods of performing routine herd husbandry procedures including:

- dehorning
- vaccination
- supernumerary teat removal
- ear tagging
- hoof trimming
- clipping
- pour-on medications
- magnet
- stomach tube
- implanting growth promotants

Describe procedures for scheduling, recording, and monitoring of significant herd health events including:

- day book
- Q-Sum chart
- 21 day calendar
- computer software
- individual cow health cards
- storage of post-mortem and culture information
- consultation with herd health specialists

Describe the completion of required documentation including:

- preparation of herd health list
- treatments
- dates procedures performed
- pregnancy diagnosis results
- withdrawal times for treatments

4.12 Describe reproductive health or cycles. (13/3 hrs)

Describe the reproductive cycle of the cow including:

- age at puberty
- length of the oestrous cycle
- signs of oestrus (heat)
- hormones involved
- anatomy of the female reproductive tract
- breeding
- pregnancy

Describe heat detection methods including:

- behavioural signs of oestrus
- observation
- patch type indicators
- pedometers
- records
- effect on milk production
- post-oestrus blood
- progesterone assay

Identify interventions in the reproductive cycle including:

- use of prostaglandins
- treatment of cystic ovaries
- time of insemination
- time of pregnancy diagnosis
- induction of calving
- assistance at calving
- retained placenta
- therapeutic flushes
- intra-uterine infusions
- oestrus synchronization

Describe the completion of documentation including:

- calving dates
- calving to conception interval
- date of first heat post-calving
- subsequent heats
- inter-oestral interval
- breeding dates
- results of pregnancy diagnosis
- treatments and dates

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
80%	20%	100%

Number:	S0905		
Title:	**Routine Herd Maintenance Theory and Procedures**		
Duration:	Total Hours: 48	Theory: 33	Practical: 15
Prerequisites:	Grade 12		
Content:	S0905.1	Identify safe work habits when performing routine herd maintenance procedures. (2/0 hrs)	
	S0905.2	Describe animal breeding protocol and procedures. (6/2 hrs)	
	S0905.3	Describe the maintenance and feeding procedures for feed dry cows and close-up heifers. (3/3 hrs)	
	S0905.4	Describe the calving stages. (2/2 hrs)	
	S0905.5	Describe procedures for young calf rearing. (8/3 hrs)	
	S0905.6	Describe the maintenance, feeding, and breeding procedures for heifers. (4/2 hrs)	
	S0905.7	Describe the methods for humanely handling animals. (5/2 hrs)	
	S0905.8	Describe accommodation factors. (3/1 hrs)	

Evaluation & Testing:
Assignments related to theory and application skills
Minimum of one mid-term test during the term
Final test at end of term
Periodic quizzes

Instructional and Delivery Strategies:
Lecture
Video
Paper based material
Internet On-Line
Practical Projects

Reference Materials:
OMAFRA Fact Sheets
Manufacturer's Manuals

Number:	S0905.1		
Title:	**Routine Herd Maintenance**		
Duration:	Total Hours: 48	Theory: 33	Practical:15
Cross-Reference to Training Standards: U5380.0, U5383.0, U5384.0, U5386			

General Learning Outcome

Upon successful completion, the apprentice is able to identify, describe, and document routine herd maintenance procedures.

Learning Content

5.1 Identify safe work habits when performing routine herd maintenance procedures. (2/0 hrs)

Identify safe work habits required when performing routine herd maintenance procedures including:

- safety hazards
- working around and handling animals
- cleaning and maintaining barn facilities and environment
- handling medications
- handling treatments
- cleaning solutions
- protective clothing and gear
- good housekeeping

5.2 Describe animal breeding protocol and procedures. (6/2 hrs)

Describe mating procedures including:

- natural
- artificial
- synchronized heat detection
- heat signs
- documentation

Identify timing of rebreeding protocols including:

- calving to conception interval
- days open
- services per conception

Describe timing of breeding during oestrus including:

- heat cycle
- heat period
- a.m./p.m. rule

Describe pregnancy test methods including:

- rectal palpation
- ultra sound
- progesterone
- documentation

Describe sire selection procedures including:

- proven sires
- test sires
- sire index
- computer assisted mating programs

Describe procedures for the completion of documentation including:

- breeding dates
- observed heats
- synchronization dates
- breeding wheel
- 21 day calendar
- post oestrus blood
- calving dates
- palpation dates
- computerized records

5.3 Describe the maintenance and feeding procedures for dry cows and close-up heifers. (3/3 hrs)

Identify procedures for body condition scoring. Describe drying-off procedures including:

- timing
- feed restriction
- water restriction
- abrupt-versus-gradual drying
- dry cow treatments

Describe methods for preparing and maintaining calving area including:

- maternity stall
- maternity pen
- sanitation
- duration of use
- space

Describe stages of gestation and trimesters.

Describe procedures for the completion of documentation including:

- pre-calving vaccination
- drying dates
- calving information

5.4 Describe the calving stages. (2/2 hrs)

Describe the stages of calving.

Describe abnormal and normal birthing presentations including:

- normal birth positions
- abnormal birth positions
- giving assistance

Describe normal birthing protocols including:

- maternity pen
- box stall
- sanitation
- calf removal

Describe abnormal birthing protocols including:

- resuscitation techniques
- required qualified assistance

Describe procedures for the completion of documentation including:

- identification
- calving dates
- sex of calves
- weight
- calving ease

5.5 Describe procedures for young calf rearing. (8/3 hrs)

Identify alternative identification methods including:

- national livestock identification tag
- ear tags
- neck chains
- electronic ID
- registration drawing/pictures
- tattoo

Describe procedures for navel dipping, injections, vaccinations, dehorning, castrations, and colostrums including:

- colostrums
- assessment
- feeding procedures
  - pail
  - nipple bottle
  - stomach tube
- navel dip versus spray
- injections
  - intramuscular
  - subcutaneous
  - intravenous
- oral administration
- intranasal administration
- vaccinations
- dehorning
  - freezing procedures
  - electronic
  - paste
  - gouger
- castration
  - elastrator
  - burdizzo
  - surgical
- tail docking

Identify symptoms of unwellness including:

- alertness
- rectal temperature
- eyes
- ears
- respiration rate
- fecal consistency
- hair coat
- heart rate

Describe alternative calf rearing facilities including:

- calf stalls
- calf pens
- calf hutches
- fabric buildings

Describe procedures for completing documentation.

5.6 Describe the maintenance, feeding, and breeding procedures for heifers. (4/2 hrs)

Describe methods of heat detection including:

- patch-type indicators
- synchronization
- teaser animal/gomer bull
- visual observation
- pedometers
- records
- progesterone assay

Describe signs of heat including:

- restlessness
- mounting
- standing to be mounted
- reduced appetite
- swollen or reddened vulva
- mucous or blood discharge
- bawling

Describe procedures for evaluating body condition including:

- weighing
- taping
- plotting
- scoring 1-5
- measuring wither height

Describe feeding programs for heifers including:

- balanced rations
- milk phase
- calf starter
- grower supplements
- hay
- hay/corn silage
- pasture management

Describe procedures for completing documentation:

- monitoring growth
- breeding records
- pen groupings

5.7 Describe methods for humanely handling animals. (5/2 hrs)

Identify the five (5) basic animal freedoms:

- to perform natural behaviour
- freedom from disease
- freedom from environmental extremes
- freedom from maltreatment
- freedom from malnutrition

Describe components of animal handling facilities including:

- rope halter
- squeeze
- head gate
- weigh scales
- cow lift
- holding pen
- crowd gate

Identify the purpose and contents of the “Recommended Code of Practice for the Care and Handling of Dairy Cattle” including:

- housing
- feed
- water
- herd management
- transportation
- processing facilities

Describe the pertinent legislation for dealing with non-ambulatory animals.

5.8 Describe accommodation factors. (3/1 hrs)

Identify the factors impacting on animal comfort including:

- temperature
- space
- ventilation
- sanitation
- lighting
- handling
- exercise
- flooring
- bedding
- feed
- water

Identify alternative bedding materials including:

- straw
- shavings
- newspaper
- sand
- compost
- sawdust
- water

Identify alternative tie-stall and free-stall bases including:

- concrete
- rubber
- mattress
- sand
- clay

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
68%	32%	100%

Number:	S0906		
Title:	**Farm Mechanical and Electrical Systems — Basic Maintenance**		
Duration:	Total Hours: 54	Theory: 33	Practical: 21
Prerequisites:	Grade 12		
Content:	S0906.1	Identify safe work habits when working around and performing basic maintenance on farm mechanical and electrical systems. (2/0 hrs)	
	S0906.2	Describe the operating principles and basic maintenance procedures of watering systems. (5/4 hrs)	
	S0906.3	Describe the operating principles and basic maintenance procedures for manure removal and spreader equipment. (5/5 hrs)	
	S0906.4	Describe the operating principles and basic maintenance procedures for farm electrical systems. (5/5 hrs)	
	S0906.5	Describe the operating principles and basic maintenance procedures for milking systems. (10/6 hrs)	
	S0906.6	Describe the operating principles and basic maintenance procedures for automatic and manual feeding systems. (5/2 hrs)	

Evaluation & Testing:
Assignments related to theory and application skills
Minimum of one mid-term test during the term
Final test at end of term
Periodic quizzes

Instructional and Delivery Strategies:
Lecture
Video
Paper based material
Internet On-Line
Practical Projects

Reference Materials:
OMAFRA Fact Sheets
Manufacturer’s Manuals

Number:	S0906.1		
Title:	**Farm Mechanical and Electrical Systems — Basic Maintenance**		
Duration:	Total Hours: 54	Theory: 33	Practical:21

Cross-Reference to Training Standards: U5380.0, U5381.0, U5382.0, U5383.0, U5384.0, U5385.0

General Learning Outcome

Upon successful completion, the apprentice is able to identify and describe the operating principles and basic maintenance procedures for farm mechanical and electrical systems.

Learning Content

6.1 Identify safe work habits when working around and performing basic maintenance on farm mechanical and electrical systems. (2/0 hrs)

Identify required safe work habits when working around and performing basic maintenance on farm mechanical and electrical systems including:

- working around farm mechanical and electrical systems
- cleaning and maintaining farm mechanical and electrical systems
- handling tools, equipment, and cleaning solutions
- safe work habits
- protective clothing and gear
- good housekeeping

6.2 Describe the operating principles and basic maintenance procedures of watering systems. (5/4 hrs)

Identify the operations and functions of each component/part including:

- pumps
- wells
- pressure tanks
- foot valves
- valves
- pressure switches
- water softeners
- water bowls

- hot water tanks
- sinks
- drains
- water bowls
- pipes

Describe maintenance and corrective actions for replacing or repairing component/part and the assembled system including:

- pumps
- wells
- pressure tanks
- foot valves
- valves
- pressure switches
- water softeners
- water bowls
- hot water tanks
- sinks
- drains
- water bowls
- pipes
- priming pump
- pre-charging tank
- procedures for trouble shooting system problems

6.3 Describe the operating principles and basic maintenance procedures for manure removal and spreader equipment. (5/5 hrs)

Identify the component and parts of manure removal and spreader systems including:

- gutter cleaners
- alley scrapers
- flush systems
- gravity flow
- slatted floors
- pumps
- pneumatic systems
- solid spreaders
- liquid spreaders
- sand separators

Describe basic maintenance and safety procedures for spreaders including:

- circle check
- checking tires
- cleaning parts and methods
- greasing and oiling
- safe operating procedures
- operator’s manual
- shields
- completion of records/log book

6.4 Describe the operating principles and basic maintenance procedures for farm electrical systems. (5/5 hrs)

Identify the operations and functions of farm electrical system components and controls including:

- fundamentals of electricity
- wiring
- 2 way circuits
- 3 way circuits
- 3 phase
- single phase
- receptacles
- motors
- controls
- fuses
- breakers
- temperature cut outs
- thermostats
- relays

Describe safety and energy conservation principles of electrical systems including:

- system lock outs
- stray voltage
- energy saving methods

Identify basic maintenance procedures for electrical systems including:

- resetting breakers
- changing fuses
- cleaning dust, dirt and moisture
- checking for damaged or loose connections
- repairing extension cords
- system and wiring inspections

6.5 Describe the operating principles and basic maintenance procedures for milking systems. (10/6 hrs)

Identify the milking slope for various line sizes in both glass and stainless steel milk lines including:

- slope percentage (1.0%, 1.25%, 1.5%)
- 1.5 inches in 10 feet (metric 3.81 cm in 3.048 m)
- inches in 10 feet (metric 2.54 cm in 3.048 m)

Identify the milk line inlet position and required basic maintenance including:

- glass line
  - top 1/3 of milk line
  - couplers - air leakage
  - gaskets - replacement
  - rubber inlet caps - replacement
- stainless steel
  - top 1/3 of milk line
  - square door type
  - top of milk line
  - tight
  - worn
  - replacement
- hose cane
  - bent
  - worn
  - replacement

- horizontal slides
  - spring tension
  - clamp tension
  - inlet pads
    - inking
  - replacement
    - square door type
    - vertical
- nipple inlets
  - rubber inlet caps
  - replacement

Describe basic maintenance procedures and defective part replacement of the milking cluster including:

- milking claw
  - gaskets
  - claw vent or inflation vents
  - shut offs
- inflations (liners)
  - replacement schedule
  - alignment indicator marks
  - adjustment schedule for one piece and two piece
- shells
  - compatible with inflation (liner)
  - dents
  - cracks
  - one piece
  - two piece
- milk hoses (rubber, plastic)
  - 3A standards
  - cracks
  - holes
  - opaque
  - crimping in hanger (softness)
  - brittle

- air hoses
  - 3A standards
  - cracks
  - holes
  - opaque
  - crimping in hanger (softness)
  - brittle
- automatic take offs (pneumatic, electronic)
  - dealer service

Identify basic maintenance procedures for pulsates including:

- pneumatic
  - cleaning
  - oiling
  - dealer service
  - stall cocks
- electro-magnetic
  - cleaning
  - replacement kits - frequency
  - dealer service
  - wiring - contacts
  - stall cocks

Identify basic maintenance procedures for air filters including:

- vacuum pump
  - replacement schedule
  - washing/cleaning
- interceptor (moisture/filter trap)
  - cleaning mesh filter
  - drainage
- regulator
  - washing
  - cleaning
- pulsate filtered airline
  - cleaning
  - replacement schedule

Describe basic maintenance procedures for vacuum pumps including:

- oiler
- oil reclaimed
- oil filters
- exhaust flapper
- oil less pumps
- variable speed pumps
- drive belt tension
- safety shields
- service schedules

Identify basic maintenance procedures for receiver group components including:

- sanitary trap
  - gaskets
  - moisture drain
  - regular inspection
  - routine manual cleaning
  - emergency shut off
- receiver jar
  - glass
    - gaskets
    - probes (cleaning)
    - air leakage
    - diverter
    - inking of rubber parts
  - stainless steel
    - inspection ports
    - gaskets
    - probes
    - air leakage
    - diverter
    - inking of rubber parts
- transfer line
  - plastic hose
    - replacement schedule
  - stainless steel
    - gasket
    - inking of rubber parts

- micro switch/safety switch
  - type
  - functional
  - positions
    - milking
    - washing
- milk filter
  - type
  - assembly
  - replacement schedule

Describe basic maintenance procedures for plate coolers including:

- disassembly
- cleaning procedures
- routine schedule
- DFO Field Service Representative’s direction
- milk filter
- drainage

Describe basic maintenance procedures for the bulk milk tank including:

- daily inspection
  - cleaning
  - valve leakage
  - inking of rubber parts
- tank washer
  - function
  - inspection
  - chemicals
- temperature
- secondary tank maintenance

Describe basic maintenance procedures for compressors including:

- cleaning of rad screens/grills
- ventilation

Describe basic maintenance procedures for heat exchangers including:

- heat exchangers
  - plumbing leaks
- hot water heaters
  - electrical
    - fuses
    - breakers
    - resets
  - gas/oil fired
    - pilot light
    - exhaust
    - tank level readings
    - functioning (water temperature)
    - plumbing leaks
- water softener

Describe basic maintenance procedures for automatic washers including:

- pipeline systems
  - screens
  - timers
  - proportioners
  - sink volume
  - mechanics
  - air injectors
    - manual
    - electronic
    - functioning
  - cycles
  - temperature monitoring
- robotics
- bulk milk tank
  - screens
  - timers
  - proportioners
  - volume
  - temperatures
  - cycles
  - visual inspection
  - mechanics
  - inking of rubber parts
  - functioning

Identify pertinent Milk Act regulations and recommendations.

Describe the procedures for completion of the milking system maintenance record/log book.

6.6 Describe the operating principles and basic maintenance procedures for automatic and manual feeding systems. (5/2 hrs)

Identify required safe work habits when working around and performing basic maintenance on automatic and manual feeding systems.

Identify the operations and functions of feeding system components including:

- loading/unloading systems and equipment
- forage handling equipment
  - round bale unroller
  - silage block cutter
- bins
- auger
  - rigid
  - flex
- conveyor
  - proportioner
  - weighing device
- feed mill
  - roller
- feed bunk/manger
- parlour feeder
- computerized feeding stall
- TMR mixer

Describe basic maintenance procedures including:

- cleaning parts
- installing/replacing safety guards
- lubrication of parts
- identifying defective parts
  - scales
  - dials
  - gauges
- checking/adjusting
  - belts
  - chains
  - silo unloaders

Describe the procedures for completion of the automatic and manual feeding systems maintenance record/log book.

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
60%	40%	100%

Number:	S0907	
Title:	**Farm Mechanical Equipment — Basic Maintenance**	
Duration:	Total Hours: 21	Theory: 15 Practical: 6
Prerequisites:	Grade 12	
Content:	S0907.1	Identify required safe work habits when working around and performing maintenance on farm mechanical equipment. (2/0 hrs)
	S0907.2	Describe the operating principles and basic maintenance procedures for farm tractors, skid steer, ATVs, and accessories. (5/3 hrs)
	S0907.3	Describe the operating principles and basic maintenance procedures for farm trucks. (2/1 hrs)
	S0907.4	Describe the operating principles and basic maintenance procedures of material handling equipment. (2/2 hrs)
	S0907.5	Describe the operating principles and basic maintenance procedures of emergency generators and equipment. (4/0hrs)

Evaluation & Testing:
Assignments related to theory and application skills
Minimum of one mid-term test during the term
Final test at end of term
Periodic quizzes

Instructional and Delivery Strategies:
Lecture
Video
Paper based material
Internet On-Line
Practical Projects

Reference Materials:
OMAFRA Fact Sheets
Manufacturer’s Manuals

Number:	S0907.1
Title:	**Farm Mechanical Equipment — Basic Maintenance**
Duration:	Total Hours: 21 Theory: 15 Practical:6

Cross-Reference to Training Standards: U5380.0, U5381.0, U5382.0, U5383.0, U5384.0, U5385.0, U5386.0

General Learning Outcome

Upon successful completion, the apprentice is able to identify and describe the operating principles and basic maintenance procedures for farm mechanical equipment.

Learning Content

7.1 Identify require safe work habits when working around and performing basic maintenance on farm mechanical equipment. (2/0 hrs)

Identify required safe work habits when working around and performing basic maintenance on farm mechanic equipment including:

- tractors and accessories
- pre-operational check procedures
- safety devices and equipment
- safety of others
- safe driving procedures
- protective clothing and gear
- Highway Traffic Act
- machinery safety devices
- danger zone around moving equipment
- safety zone around moving equipment

7.2 Describe the operating principles and basic maintenance procedures for farm tractors, skid steer, ATVs, and accessories. (5/3 hrs)

Identify safety procedures and regulations when working around farm tractors, skid steer and ATV and accessories including:

- Highway Traffic Act
- pre-operational check

Identify the operations and functions of the basic components or parts of tractors, skid steer, ATV including:

- operator manuals
- engine operation
- hydraulic operations and controls
- transmissions
- power take-off
- clutches
- three point hitch
- loaders
- controls
- electrical system

Describe basic maintenance procedures including:

- oil changes
- air filter replacement
- hydraulic oil changes
- belts
- cleanliness

Identify corrective actions for worn, damaged, or defective parts or systems including:

- faulty electrical
- clutch adjustment
- hydraulic components

Describe the procedures for completion of the maintenance documentation.

7.3 Describe the operating principles and basic maintenance procedures for farm trucks. (2/1 hrs)

Identify safety procedures and regulations that must be observed when operating a truck including:

- Highway Traffic Act
- Government regulations
- machinery safety devices
- pre-operational check
- safety devices
- safety zone around moving equipment
- safety hazards which can occur when maintaining truck
- pre-operational check procedures
- procedures for the safety of others
- safe driving procedures

Identify the operation and functions of the components or parts of trucks including:

- engine
- transmission
- controls
- fuels

Identify corrective actions for worn, damaged, or defective parts and systems including:

- belts
- chains
- tires
- controls and switches
- systems

Describe basic truck maintenance procedures including:

- oil changes
- maintenance intervals
- belts
- tires
- emergency brakes

Describe the completion of required maintenance records.

7.4 Describe the operating principles and basic maintenance procedures of material handling equipment. (2/2 hrs)

Identify safety procedures and regulations when operating and maintaining material handling equipment including:

- OHSA (Farm Safety Act)
- machinery safety devices
- safety zone around moving equipment
- safety hazards
- pre-operational check procedures
- safety of others

Describe the operations and functions of the components and parts of material handling equipment and accessories including:

- pto’s
- augers
- bearings
- belts
- gear boxes
- cutter blades

Identify corrective actions for the repair or replacement of worn, damaged, or defective parts and system.

Describe basic maintenance procedures. Describe the completion of maintenance records.

7.5 Describe the operating principles and basic maintenance procedures of emergency generators and equipment. (4/0 hrs)

Identify safety procedures and regulations when operating and maintaining emergency generators and equipment including:

- OHSA (Farm Safety Act)
- machinery safety devices
- safety zone around equipment
- operating procedures
- pre-operational check procedures
- safety of others
- working with electricity
- ventilation procedures

Describe the operation and functions of the components and parts of emergency generators and equipment including:

- switches
- connections
- stray voltage
- power source
- governors
- energy source

Describe basic maintenance procedures including:

- moisture free clean environment
- checking wires and connectors
- cleaning of moving parts
- checking controls and switches
- lubrication

Describe the completion of maintenance records.

Evaluation Structure		
Theory Testing	Practical Application Testing	Final Assessment
70%	30%	100%

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