

ENVIRONMENTAL ENRICHMENT PROGRAM FOR DAIRY CATTLE**1. PURPOSE**

To list and describe how to provide environmental enrichment to dairy cattle of all life stages (calf, heifer, lactating cow, dry cow).

2. RESPONSIBILITY

- 2.1 Trained and qualified personnel
- 2.2 Herd manager
- 2.3 Veterinarian
- 2.4 Nutritionist

3. CONSIDERATIONS

- 3.1 The purpose of environmental enrichment is to provide cattle with opportunities to express basic behavior needs, to promote species-typical, non-injurious behavior and to promote physical and mental health thus enhancing animal welfare. Environmental enrichment should be biologically relevant, so that it does not lose its enriching value over time.
- 3.2 The environmental enrichment program must be approved by a veterinarian. This includes enrichment provided within the animal facility, provided as part of an Animal Use Protocol (AUP), or provided in Alternative Locations for Procedures and Housing of Animals (ALPHA) locations.
- 3.3 Deviation or exemption from this environmental enrichment program must be scientifically justified in the AUP and approved by the FACC or prescribed for medical reasons by a veterinarian. Conversely, the research personnel should be informed of any upcoming modifications to the enrichment program prior to their implementation.
- 3.4 Enrichment corresponds to the complexification of an animal's living environment aiming to stimulate an animal's senses and/or cognition to benefit its welfare.
- 3.5 TYPES OF ENRICHMENT:
 - 3.5.1 Nutritional Enrichment: e.g., varied feeds or feed delivery methods.
 - 3.5.1.1 Neophobia towards unfamiliar food may limit the use of 'treats' in naive adult cows, however familiarizing youngstock with a variety of feeds may allow for this type of enrichment to be beneficial later in the animal's life.
 - 3.5.2 Social Enrichment: e.g., contact and interactions with other individuals of the same species and humans.
 - 3.5.2.1 Herds contain more and less dominant animals. Separation from the cohort/herd requires scientific, welfare or medical justification:
 - Incompatibility (aggression)
 - Medical reasons
 - Specific protocol approved by the FACC.
 - 3.5.2.2 Antagonistic behavior has shown to decrease with frequency of social interactions with the same individuals (conflict between cows is decreased when exercised daily verses less frequently).
 - 3.5.3 Physical Enrichment: e.g., varied/novel objects, spaces, or toys.
 - 3.5.4 Sensory Enrichment: e.g., varied/novel smells, sounds, textures.
 - 3.5.5 Occupational/Cognitive Enrichment: e.g., encouraging exercise, problem solving.

- 3.6 Methods of enrichment may satisfy multiple categories (e.g.: providing exercise access in an outdoor yard is physically, socially and occupationally enriching).
- 3.7 FOD cows are dry cows with >3-4 weeks left before their next calving.
- 3.8 CUD cows are dry cows due to calve in 3 weeks or less.

4. PROCEDURE

- 4.1 Effort should be made to provide as much effective enrichment as possible within reason. See [Table 1 Environmental enrichment for different cattle housing/life stage](#) for possible ways to enrich the environment of cows, calves and heifers on the farm.

Table 1: Environmental enrichment for different cattle housing/life stage

	Enrichment Type			
	Nutritional	Social	Physical	Occupational-Sensory-Cognitive
Calves (Pens)	<ul style="list-style-type: none"> - Teat-feeders - Feed variety - Pellet bottle 	<ul style="list-style-type: none"> - Group housing - Positive interactions with humans 	<ul style="list-style-type: none"> - Age/group-size appropriate pens - Spreading bedding - Moving pens/ bedding variety 	<ul style="list-style-type: none"> - Fixed brushes
Heifers (Free Stall)	<ul style="list-style-type: none"> - Feed variety - Pasture grazing 	<ul style="list-style-type: none"> - Group housing - Appropriate stocking density - Positive interactions with humans 	<ul style="list-style-type: none"> - Age/group-size appropriate pens - Pasture (pregnant) - Moving pens 	Fixed Brushes
Cattle (Tie-Stall)	<ul style="list-style-type: none"> - Pasture grazing (FOD cows) - Feed variety 	<ul style="list-style-type: none"> - Daily outdoor exercise as a herd - Positive interactions with humans 	<ul style="list-style-type: none"> - Daily outdoor exercise as a herd - Rotate exercise paddocks - Trees/shade in paddocks 	<ul style="list-style-type: none"> - Daily outdoor exercise as a herd
Cattle (Box Stall)	<ul style="list-style-type: none"> - Feed variety - Salt/mineral/molasses block 	<ul style="list-style-type: none"> - Place cattle in adjacent box stalls - Positive interactions with humans 	<ul style="list-style-type: none"> - Moving pens 	<ul style="list-style-type: none"> - Fixed Brushes
Cattle (in pasture)	<ul style="list-style-type: none"> - Rotational grazing - Feed variety - Mineral block 	<ul style="list-style-type: none"> - Positive interactions with humans - Group housing - Appropriate stocking density 	<ul style="list-style-type: none"> - Shade structures - Rotational grazing - Outdoor access as a group 	<ul style="list-style-type: none"> - Rotational grazing - Outdoor access as a group

4.2 NUTRITIONAL ENRICHMENT

4.2.1 Teat feeders and pellet bottles:

4.2.1.1 Feed calves milk/milk replacer and pellets from receptacles fitted with teats to satisfy suckling reflex.

4.2.1.2 Procedure outlined in [DC-505: Calf Care: Feeding](#).

4.2.2 Feed variety:

4.2.2.1 Calves and heifers

4.2.2.1.1 Provide a mixture or rotation of age-appropriate feedstuffs.

4.2.2.1.2 The calf/heifer procedure providing more detail is outlined in SOP DC-505: Calf Care: Feeding.

4.2.2.2 Cattle (tie-stalls)

4.2.2.2.1 Ensure a variety of forage crops are planted to be used in the Total Mixed Ration (TMR).

4.2.2.2.2 For cows in early lactation, follow the procedure outlined in SOP DC-406: Post-Partum Care of Dairy Cattle.

4.2.2.2.3 For cows at lactation peak, dry corn and concentrate pellets (i.e.: Robostart) will be provided as a top-up of the TMR to individual animals, as determined by a nutritionist.

4.2.2.2.4 For cows nearing the end of their lactation and for cows destined to be sold off to the auction, follow the procedures outlined in SOP DC-614: Dry Treating Cows and SOP DC-350 Reducing Milk Production of Cull Cattle.

4.2.2.3 Cattle (box stalls, pasture)

4.2.2.3.1 Offer dry cows a Far-off Dry (FOD) or Close-up Dry (CUD) ration in addition to 1st cut hay, in accordance to their gestation stage.

4.2.3 Salt/mineral/molasses blocks:

4.2.3.1 Provide blocks nutritionist/vet-approved for the appropriate age/stage of lactation.

4.2.3.2 Ensure that each box stall contains a Mineral Block Synchro 16-4.

4.2.3.3 Ensure that cattle on pasture have access to Mineral Block Synchro 10-10.

4.2.4 Rotational grazing/pasture access:

4.2.4.1 Seed and maintain a variety of grasses and legumes in pastures.

4.2.4.2 Rotate animals amongst the pastures throughout the growing season.

4.3 SOCIAL ENRICHMENT

4.3.1 Group Housing:

4.3.1.1 Group house calves and heifers in pens with a similar age cohort/feeding regimen.

4.3.2 Positive, predictable human interactions:

4.3.2.1 All humans in contact with the animals must interact consistently and positively.

4.3.2.2 Interactions can be tactile (ex. petting, scratching, massaging, brushing) and vocal (ex. speaking/praising calmly).

4.3.3 Compatible groupings:

4.3.3.1 Bonds between pen-mates are formed as calves persist into adulthood (Raussi et al., 2010).

4.3.3.2 Maintain groups/neighbors involving positively bonded animals whenever possible to increase positive interactions (ex. allogrooming) and reduce stress (Sato et al., 1993).

4.3.4 Appropriate stocking density:

4.3.4.1 Minimizes competition/antagonistic social interactions over bed and bunk space.

4.3.4.2 Small calf pens should have a maximum of 3 calves under 1 month old, and a maximum of 2 calves over 1 month old.

4.3.4.3 Large calf pens should have a maximum of 3 calves per pen.

4.3.4.4 Heifer barn pens should not be stocked over the number of beds and headgates.

4.3.4.5 Box stalls should contain only one cow (and newborn calf(s)). Efforts should be made to fill adjacent box stalls first so that cows have a neighbor they can interact with.

4.4 SENSORY/OCCUPATIONAL/COGNITIVE ENRICHMENT

4.4.1 Fixed brushes:

4.4.1.1 Mount brushes on the side of calf pens to provide the opportunity to self-groom.

4.4.1.2 Replace brushes as needed when bristles are worn.

4.4.1.3 Disinfect brushes with Virkon® (following product directions) as needed in the event of a contagious disease (i.e.: Ringworm) and consult with a veterinarian.

4.4.2 Outdoor exercise:

4.4.2.1 Tie-stall cattle are provided with approximately 1.5 hours of daily exercise as a herd in exercise paddocks (see [SOP DC-361: Outdoor Exercise of Tie-Stall Dairy Cattle](#))

4.4.3 Scratching structures:

4.4.3.1 Trees or man-made structures make an interactive heterogeneous environment (ex. rubbing on trunks/wooden posts, shelter from sun and rain)

4.4.3.2 Plant trees in pastures that are lacking shade.

4.4.3.3 Provide shade structures in pastures and exercise paddocks without shade-bearing trees.

4.4.4 Pasturing:

4.4.4.1 Heifers and dry cows should be allowed to pasture (season-dependent) leading up to parturition to express natural behaviors.

4.4.4.2 Heifers must be diagnosed and confirmed pregnant by the herd veterinarian before pasturing.

4.4.4.3 Far-Off Dry (FOD) cows are non-lactating (dry) pregnant cows that have more than 3-4 weeks before calving.

4.4.4.4 FOD cows should be allowed to pasture as soon as they are dry (See SOP DC-614: Dry Treating Cows) until they require Close-Up Dry (CUD) treatments, CUD TMR, and parturition monitoring (3-4 weeks pre-parturition).

4.5 PHYSICAL ENRICHMENT

4.5.1 Spreading bedding:

4.5.1.1 Dump new bedding in a pile on the bed of calf pens to encourage locomotor play.

4.5.1.2 If the calf does not engage in spreading the bedding, or loses interest after a few minutes, spread the bedding manually (see SOP DC-209: Calf Pen Sanitation).

- 4.5.1.3 Moving pens/bedding variety:
- 4.5.1.4 Move calves to larger pens with different bedding types (paper, straw, wood shavings) to encourage exploratory and locomotor play.
- 4.5.1.5 Bedding variety will depend on availability, however during colder months a deep straw (10+ cm) should be maintained for newborn calves.
- 4.5.2 Age/group-size appropriate pens: Pens should be large enough to encourage play and reduce competition in the group (see [‘Appropriate Stocking Density’](#) above).
- 4.5.3 Pasture rotation: Exposure to novel pasture environments throughout the season (see [‘Rotational Grazing/Pasture Access’](#) and [‘Pasturing’](#) sections above).
- 4.5.4 Outdoor exercise: Daily exercise as a herd in paddocks (see [‘Outdoor Exercise’](#) section above).
- 4.5.5 Shade structures: Trees or man-made structures make a heterogeneous environment and provide cover from the sun and rain (See [‘Shade Structures’](#) section above).

5. REFERENCES

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