



Beef Cattle Housing and Equipment Guidelines

COMPLETE INSTRUCTIONS

When designing beef cattle facilities, it pays to provide the required space, shelter, feed, water, waste management and livestock handling features, adapt them to the natural features of the site, and organize them for efficient and easy operation. Beef cattle live through three phases of growth; cowcalf, growing calf and finishing. The season at the beginning of each phase affects what facilities are needed; for example, safe calving in January requires more elaborate shelter than calving in March. For winter and early spring calving, a dry, draft-free shelter is desirable. Cow-calf herds may graze on range or pasture during summer months but need some protection in the winter. Feeder cattle are usually penned in relatively confined areas. All ages of cattle suffer more from mud, wet weather and cold winter winds than from low temperatures alone. Windbreaks and open-front sheds, when properly laid out, can give adequate protection. Plans in this series show various proven components for making efficient beef cattle housing, handling and feeding facilities.

Location

Construct buildings and pens for beef cattle on a well-drained site. An ideal location is a south-facing slope on well-drained soil, near an adequate water supply but away from streams and population centers. Natural shelter provided by trees is also desirable.

Drainage

Where existing slopes are too flat to provide good drainage (flatter than 1:25), move fill to increase effective slope and to build earth mounds. Shape pens so that drainage is away from resting, feeding and watering areas. Slope barn roofs away from the pens, or provide eavestroughs to carry water away from the pens.

In heavy traffic areas such as around feeders and waterers, concrete paving will prevent mud holes. In higher rainfall areas (over 20 in. (500 mm) annually) the entire pen can be paved.

Shelter

In areas subject to cold winter winds where natural shelter is insufficient, porous windbreak fences (20% open) give the best protection. In regions of heavy snow accumulation, add a tree shelter belt or snow fence about 150 ft. upwind from a windbreak fence; this leaves enough space between the fences for a snow trap.

Protection of the resting area from rain and snow can be provided by an open-end barn, or an open-front shed with a roof that slopes away from the opening. In most areas these openings should face south for protection from winter winds and to get the most benefit from the winter sun.

Ventilation

Buildings for beef cattle must be adequately ventilated to prevent the accumulation of heat and moisture. Eave and ridge openings are recommended for air movement in open-front buildings. If the same buildings are to be used as summer sunshades, hinged panels, adjustable curtains or large doors in the back wall should be considered.

Feeding

Feeders should be placed high enough so that lot drainage is away from the feeding area. Concrete aprons are recommended along the feeder; they should be at least as wide as the scraper and wheels of the tractor used for scraping, and sloped at least 1:25 away from the bunks. Build a step 4 to 6 in. (100 to 150 mm) high and 12 to 16 in. (300 to 400 mm) wide next to the bunk. If possible, run bunks in a north-south direction so that no part of the feeding area is permanently shaded from the sun. This helps to reduce buildup of frozen manure in the shade of the bunk.

Runoff Control

Runoff from cattle lots and manure storage areas must not be permitted to enter any watercourse. Diversion banks or ditches may be needed to prevent 'clean' runoff from surrounding fields and roadways from entering the cattle lots. Also, settling and retention basins are usually required to trap and hold runoff from the lots during spring thaw and heavy rains. Refer to provincial regulations regarding restrictions.

Table 1. Feedlot and Shed Guidelines

Imperial

Requirements	Unit	Cows and bred heifers	Calves to 500 lb	Feeders to 750 lb	Feeders to 1100 lb
Feedlot without shed					
- lot area, if paved ¹	ft ² /head	80	40	45	80
- earth lot area ²	ft ² /head	300	150	250	300
- bedded mound area ³	ft ² /head	35	25	30	35
Feedlot with shed					
- paved outside lot area	ft ² /head	50	25	30	50
- earth outside lot area	ft ² /head	300	150	250	300
- shed area	ft ² /head	30	15	20	30
- shed min. clear height	ft	10	10	10	10
Slotted Floors					
100% slotted (2 to 2.5 ft ² /100 lb of live animal)	ft ² /head	—	11	16	27
Maternity Pens					
additional, not slotted	cows/10 × 10 ft pen	20	—	—	—

SI(Metric)

Requirements	Units	Cows and bred heifers	Calves to 225 kg	Feeders to 340 kg	Feeders to 500 kg
Feed lot without shed					
- lot area, if paved ¹	m ² /head	7.4	3.7	4.1	7.4
- earth lot area ²	m ² /head	27.9	13.9	23.2	27.9
- bedded mound area ³	m ² /head	3.2	2.3	2.8	3.2
Feedlot with shed					
- paved outside lot area	m ² /head	4.6	2.3	2.8	4.6
- earth outside lot area	m ² /head	27.9	13.9	23.2	27.9
- shed area	m ² /head	2.8	1.4	1.9	2.8
- shed min. clear height	m	3.0	3.0	3.0	3.0
Slotted Floors					
100% slotted (0.18 to 0.23 m ² /45kg of live animal)	m ² /head	—	1.0	1.5	2.5
Maternity Pens					
additional, not slotted	cows/3 × 3m pen	20	—	—	—

¹ Paved lot slopes 1:50 to 1:25

² Earth lot slopes 1:25 to 1:15

³ Typical slope at sides of mound 1:4; sawmill chips and shavings are preferred to straw for bedded mounds.

Table 2. Water and Feedbunk Guidelines

Imperial

Requirements	Unit	Cows and bred heifers	Calves to 500 lb	Feeders to 750 lb	Feeders to 1100 lb
Water					
- surface area	ft ² /100 head	4	4	4	4
- daily demand, average	gal/1100 lb live	10	10	10	10
- daily hot weather demand, average	gal/1100 lb live	20	20	20	20
Feed Bunk¹					
- perimeter bunk					
- limit feeding	in. length/head	26-30	18-22	—	—
- full feed - once/day	in. length/head	—	—	18-24	24
- twice/day	in. length/head	—	—	9-12	9-12
-self-feeding					
- roughages only	in. length/head	8	6	8	8
- complete ration	in. length/head	6	5	6	6
- grain and concentrates only	in. length/head	3	2	3	3
- max. height at throat	in.	22	18	18	22
- max. reach (top edge of throat board to far bottom corner)	in.	34	24	30	34
- limit feeding roughages with electric wire or feed fence	in. length/head	20-24	12-16	16-20	20-24
- full or self-feeding roughages with electric wire or feed fence	in. length/head	10	6	8	10

¹ Maximum bunk width for mature cattle: - 24 in. bottom width when fed from one side.
 - 48 in. bottom width when fed from both sides.
 - 52 in. bottom width when bunk divided.

SI (Metric)

Requirements	Unit	Cows and bred heifers	Calves to 500 lb	Feeders to 750 lb	Feeders to 1100 lb
Water					
- surface area	m ² /100 head	0.37	0.37	0.37	0.37
- daily demand, average	L/500 kg live	45	45	45	45
- daily hot weather demand, average	L/500 kg/live	90	90	90	90
Feed Bunk¹					
- perimeter bunk					
- limit feeding	mm length/head	650-750	450-550	—	—
- full feed - once/day	mm length/head	—	—	450-600	600
- twice/day	mm length/head	—	—	225-300	225-300
-self-feeding					
- roughages only	mm length/head	200	150	200	200
- complete ration	mm length/head	150	125	150	150
- grain and concentrates only	mm length/head	75	50	75	75
- max. height at throat	mm	550	450	450	550
- max. reach (top edge of throat board to far bottom corner)	mm	850	600	750	850
- limit feeding roughages with electric wire or feed fence	mm length/head	500-600	300-400	400-500	500-600
- full or self-feeding roughages with electric wire or feed fence	mm length/head	250	150	200	250

¹ Maximum bunk width for mature cattle: - 600 mm bottom width when fed from one side.
 - 1200 mm bottom width when fed from both sides.
 - 1300 mm bottom width when bunk divided.

Table 3. Feed, Bedding and Manure Storage

Imperial

Requirements	Unit	Cows and bred heifers	Calves to 500 lb	Feeders to 750 lb	Feeders to 1100 lb
Approximate Feed Requirements to Estimate Storage					
- high forage system					
- hay (10% m.c.) or silage (60% m.c.)	lb/head/day	25 ¹	12 ¹	15-7	20-10
- grain and concentrate (10% m.c.)	lb/head/day	56 ¹	27 ¹	34-16	45-23
- high grain system					
- hay (10% m.c.) or silage (60% m.c.)	lb/head/day	—	—	3-7	4-10
- grain and concentrate (10% m.c.)	lb/head/day	—	—	7-16	9-23
- grain and concentrate (10% m.c.)	lb/head/day	—	—	15-11	22-16
Bedding Storage except for slotted floors	lb/head/day	5	3	4	5
Manure Storage					
- with bedding	ft ³ /head/day	1.2	0.6	0.8	1.2
- no bedding	ft ³ /head/day	1.0	0.5	0.7	1.0

SI (Metric)

Requirements	Unit	Cows and bred heifers	Calves to 225 kg	Feeders to 340 kg	Feeders to 500 kg
Approximate Feed Requirements to Estimate Storage					
- high forage system					
- hay (10% m.c.) or silage (60% m.c.)	kg/head/day	11.3 ¹	5.4 ¹	6.8-3.2	9.1-4.5
- grain and concentrate (10% m.c.)	kg/head/day	25.4 ¹	12.2 ¹	15.4-7.3	20.4-10.5
- high grain system					
- hay (10% m.c.) or silage (60% m.c.)	kg/head/day	—	—	1.4-3.2	1.8-4.5
- grain and concentrate (10% m.c.)	kg/head/day	—	—	2.3-7.3	4.1-10.5
- grain and concentrate (10% m.c.)	kg/head/day	—	—	6.8-5.0	10.0-7.3
Bedding Storage except for slotted floors	kg/head/day	2.3	1.4	1.8	2.3
Manure Storage					
- with bedding	m ³ /head/day	0.034	0.017	0.023	0.034
- no bedding	m ³ /head/day	0.028	0.014	0.020	0.028

¹ Maintenance ration only

² Bred heifer ration

Also cow ration for approximately 30 days prior to calving and after calving until cows go to pasture.