Calculator for Determining Livestock Capacity of Operations as They Existed on January 1, 2002

Purpose
- To provide a tool for determining the livestock capacity as of January 1, 2002 of confined feeding operations

Relevant Legislation
- *Agricultural Operation Practices Act*

Introduction

This guideline provides information and a calculation tool to help determine the livestock capacity of a confined feeding operation as of January 1, 2002.

Livestock capacity is the maximum number of animals that could be housed at the facility. It is dependent on species type, regional location, the housing system in use at the confined feeding operation at that time, and other factors such as the type of production. Depending on the species, the calculations are based on some or all of the above factors, and on standard animal space allocations.

The values used for the calculations were derived from a number of sources. The values were reviewed and endorsed by industry organizations.

To date, relevant published data on capacity remains limited for that time period. Most of the available published data was gathered for planning facility construction and was not derived from facilities as they were actually constructed. As a result, the values used for the calculator will be reviewed and revised if more data becomes available.

Calculating Animal Numbers

Beef

Beef calculations are based on the *2000 Alberta Feedlot Management Guide.*[1] The space allocations reflect regional differences between northern and southern Alberta. In northern Alberta, producers use a higher space allocation than in southern Alberta.

Space allocations for beef cattle are based on pen size, bunk length for full feed, and bunk length for limited feed. All three factors should be considered. The bunk length is often the deciding factor for large pen spaces.

Dairy

Dairy calculations depend on the type of housing system in use as of January 1, 2002. In free stall and tie stall housing systems the animal number is based on the number of stalls in the barn. For loose housing systems the animal number is based on the area in which the dairy cattle were housed.

Swine

Swine calculations for farrowing operations are based on the number of farrowing crates, multiplied by the number of weaning days plus seven, and divided by the number of litters per year. This calculation provides the sow capacity.

Operations with feeders, growers and weaners use a space allocation that is based on the area in which the animals were housed.

Poultry

Poultry calculations reflect production type. Layer operations use a space allocation based on the cage area and the number of cages. All other operations use a space allocation based on the area in which the birds were housed.

Sheep

Sheep numbers are calculated based on whether the animals were housed in barns or pens.

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Housed means the area where animals were fed, watered and confined. The housed area does not include alleyways or sorting areas.

Table 1. Beef[1] animal number calculations

Type of Livestock	Space Allocation (ft²/animal)	Bunk Space Full Feed (ft/animal)	Bunk Space Limited Feed (ft/animal)	Enter Pen Area (ft²)	Enter Bunk Length (ft)	Pen Calculated Animal #	Bunk Space Full Feed Calculated Animal #	Bunk Space Limited Feed Calculated Animal #
Calculation	A	B	C	D	E	D ÷ A	E ÷ B	E ÷ C
Cows/finishers (900+ lbs) northern AB	250	1.0	2.5					
Cows/finishers (900+ lbs) southern AB	200	1.0	2.5					
Feeders (450-900 lbs) northern AB	200	0.8	2.0					
Feeders (450-900 lbs) southern AB	175	0.8	2.0					
Feeder calves (<550 lbs) northern AB	175	N/A	1.3				N/A	
Feeder calves (<550 lbs) southern AB	150	N/A	1.3				N/A	

Table 2. Dairy animal number calculations

	Type of Livestock	Stalls per Animal	# of Stalls	Calculated Animal #
Calculation		A	B	A x B
Dairy stall barns	Free stall[2] - lactating cows only	1.2		
Dairy stall barns	Tie stall[2] - lactating cows only	1.1		

	Type of Livestock	Spacing (ft²/animal)	Barn Area (ft²)	Calculated Animal #
Calculation		A	B	B ÷ A
Dairy loose housing	Loose housing[3] - lactating cows only	150		

Table 3. Swine animal number calculations

	Type of Livestock	Weaning Days	Litters per Year	# of Farrowing Crates	Calculated Animal #
Calculation		A	B	C	$365 \div ((A + 7) \times B \times C)$
Swine - sows[4]		20	2.47		
		28	2.34		

	Type of Livestock		Space Allocation (ft²/animal)	Barn Area (ft²)	Calculated Animal #
Calculation			A	B	$B \div A$
Swine - feeders	Feeders/boars[3] > 400 lbs (solid/slatted)		20		
	Growers/roasters[3] 60-230 lbs	Deep bedded	14		
		Slat	9		
	Weaners[3] 13-59 lbs		4		

Table 4. Poultry bird number calculations

	Type of Livestock	Size	Space Allocation (ft²/bird)	Enter Barn (ft²)	Calculated Bird #
Calculation			A	B	$B \div A$
Meat poultry	Chicken - breeders[6] solid floor		1.3		
	Chicken[6] - pullets/broilers	Broilers	0.7		
		Kentucky fried chicken size	0.5		
	Turkey[7] - toms/breeders		3.5		
	Turkey[7] - hens (light)		2.5		
	Turkey[7] - broilers		2.0		

	Type of Livestock	Layer Colour	Cage Space (in²/bird)	Cage Area (in²)	Enter # of Cages	Calculated Bird #
Calculation			A	B	C	$B \div A \times C$
Layers	Chicken layers[5] - Liquid/belt/deep pit	White	64			
		Brown	70			

Table 5. Sheep animal number calculations

Confinement Type	Type of Livestock	Space Allocation (ft²/animal)	Confinement Area (ft²)	Calculated Animal #
Calculation		A	B	B ÷ A
Barn	Ewes/rams[8]	7		
Barn	Ewes with lambs[9]	25		
Barn	Lambs[8]	4		
Barn	Feeders[8]	4		
Outside-Hard Surface	Ewes/rams[8]	16		
Outside-Hard Surface	Lambs[8]	6		
Outside-Hard Surface	Feeders[8]	6		
Outside-Soil Surface	Ewes/rams[8]	70		
Outside-Soil Surface	Feeder lambs[8]	30		

Sources:

1 *Alberta Feedlot Management Guide.* September 2000, Feeders Association of Alberta and Alberta Agriculture and Forestry
2 Alberta Milk
3 *MDS Calculator – MDS Formulae: Implementation Guidelines Publication 707.* Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
4 Alberta Pork Producers
5 Egg Farmers of Alberta
6 Alberta Chicken Producers
7 Alberta Turkey Producers
8 *Sheep Housing Plan 4000.* Canadian Plan Services, 1974, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
9 *Lamb Facility Overview.* Alberta Lamb Producers, 2013, Tom Stolz

Conversion Table:
ft   = 0.3048 m
ft² = 0.0929 m²
in² = 6.4516 cm²

For more information

Contact your nearest NRCB field office or an AF CFO extension specialist (dial 310-0000 to be connected toll free)

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This guideline was developed by the Technical Advisory Group, a partnership between Agriculture and Forestry, the Natural Resources Conservation Board and the agricultural industry.