

Greenhouse gas emissions of Canadian beef production in 1981 as compared with 2011

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Table S1. The chemical composition of feeds used to formulate diets and estimate nutrients requirements of different classes of cattle

Type ^A	CP (%)	TDN (%)	Ca (%)	P (%)
Barley grain	12.5	83.1	0.07	0.38
Barley silage	11.1	62.6	0.46	0.27
Corn grain	10.0	88.2	0.03	0.29
Corn silage	10.0	64.0	0.28	0.26
Grass hay	10.7	62.3	0.53	0.17
Grass-legume hay	12.5	58.0	0.80	0.16
Tame or seeded (grass-legume mixture) pasture ^B				
Early season	18.2	68.0	0.77	0.37
Mid season	17.1	64.0	0.77	0.37
Late season	11.2	57.0	0.77	0.37
Natural pasture ^C				
Early season	13.5	62.0	0.35	0.15
Mid season	9.7	60.0	0.35	0.15
Late season	7.3	58.0	0.35	0.15
Bale grazing ^D	8.4	57.9	0.57	0.24
Stockpiled forages ^D	8.5	58.9	0.57	0.24
Swath grazing ^E	10.0	57.6	0.30	0.30
Soybean meal	54.0	87.0	0.29	0.71
Cow milk	26.7	^F	0.92	0.75

^A Unless indicated otherwise, the source was AARD (2011).

^B Approximated based on reports from Canadian sources (AARD, 2011; Saskatchewan Forage Council, 2014; Stewart, 1999).

^C Approximated based on reports from relevant sources (Abouguendia, 1998; NRC, 1996; Saskatchewan Forage Council, 2014).

^D Of meadow brome-grass-alfalfa (\approx 80:20 proportion; Lardner, 2013). Ca and P contents were taken from Legesse *et al* (2012).

^E Source: Lardner *et al.*, 2011.

^F NE_m and NE_g values used were 3.33 and 2.43 Mcal/kg, respectively.

Table S2. Feeding scenarios for breeding stock in 2011

Animal Category/ Code	Period	Duration (d)	Region	Major feeds
Lactating cows				
LactCow-WintWest-2011	April	30	West	Grass-legume hay; Barley grain
LactCow-WintEast-2011	April	30	East	Grass-legume hay; Corn grain
LactCow-GrazNative-2011	May-October	184	National	Native pasture
LactCow-GrazTame-2011	May-October	184	National	Tame pasture
Dry cows				
DryCow-EG-bale-2011	November-January	92	National	Bale grazing
DryCow-EG-stockpile-2011	November-January	92	National	Stockpiled forages
DryCow-EG-swath-2011	November-January	92	National	Swath grazing
DryCow-earlyDrylotWest-2011	November-January	92	West	Grass hay; Barley grain
DryCow-earlyDrylotEast-2011	November-January	92	East	Grass hay; Corn grain
DryCow-lateDrylotWest-2011	February-March	59	West	Grass hay; Barley grain
DryCow-lateDrylotEast-2011	February-March	59	East	Grass hay; Corn grain
Replacement heifers				
RepHeifCalves-West-2011	November-March	151	West	Grass-legume hay; Barley grain
RepHeifCalves-East-2011	November-March	151	East	Grass-legume hay; Corn grain
RepHeif-SummerGrazNative-2011	April-October	214	National	Native pasture
RepHeif-SummerGrazTame-2011	April-October	214	National	Tame pasture
RepHeif-WintWest-2011	November-March	151	West	Grass-legume hay; Barley grain
RepHeif-WintEast-2011	November-March	151	East	Grass-legume hay; Corn grain
Bulls				
Bull-SummerGrazNative-2011	April-October	214	National	Native pasture
Bull-SummerGrazTame-2011	April-October	214	National	Tame pasture
Bull-WintWest-2011	November-March	151	West	Grass-legume hay; Barley grain
Bull-WintEast-2011	November-March	151	East	Grass-legume hay; Corn grain
Beef Calves				
Calve-SteerNative-2011	July-October	123	National	Cow milk; Native pasture
Calve-SteerTame-2011	July-October	123	National	Cow milk; Tame pasture
Calve-HeiferNative-2011	July-October	123	National	Cow milk; Native pasture
Calve-HeiferTame-2011	July-October	123	National	Cow milk; Tame pasture

Note: The chemical composition of the feeds has been presented in Appendix 1.

Table S3. Feeding scenarios for various groups of backgrounding and finishing cattle in 2011

Animal Category/ Code	Period	Duration (d)	Region	Major feeds^A
Steers and heifers growing in confinement				
BG-noGR-Steer-West-2011	November-April	180	West	GLH ^B (6); Barley silage (36); Corn silage (18); Barley grain (40)
BG-noGR-Steer-East-2011	November-April	180	East	GLH (6); Corn silage (53); Corn grain (39); Soybean meal (2)
BG-noGR-Heifer-West-2011	November-April	180	West	GLH (6); Barley silage (36); Corn silage (18); Barley grain (40)
BG-noGR-Heifer-East-2011	November-April	180	East	GLH (6); Corn silage (53); Corn grain (39); Soybean meal (2)
BG-GR-Steer-West-2011	November-April	180	West	GLH (6); Barley silage (36); Corn silage (18); Barley grain (40)
BG-GR-Steer-East-2011	November-April	180	East	GLH (6); Corn silage (53); Corn grain (39); Soybean meal (2)
BG-GR-Heifer-West-2011	November-April	180	West	GLH (6); Barley silage (36); Corn silage (18); Barley grain (40)
BG-GR-Heifer-East-2011	November-April	180	East	GLH (6); Corn silage (53); Corn grain (39); Soybean meal (2)
Steers and heifers growing on pasture				
GR-SteerNative-2011	May-August	120	National	Native pasture
GR-SteerTame-2011	May-August	120	National	Tame pasture
GR-HeiferNative-2011	May-August	120	National	Native pasture
GR-HeiferTame-2011	May-August	120	National	Tame pasture
FEEDLOT CATTLE				
Calf-fed steers and heifers				
FL-CF-Steer-West-2011	November-June	240	West	Barley silage (10); Barley grain (90)
FL-CF-Steer-East-2011	November-June	240	East	Corn silage (9.6); Corn grain (84.7); Soybean meal (5.7)
FL-CF-Heifer-West-2011	November-June	240	West	Barley silage (10); Barley grain (90)
FL-CF-Heifer-East-2011	November-June	240	East	Corn silage (9.1); Corn grain (84.4); Soybean meal (6.5)
Yearling-fed (backgrounded in confinement only)				
FL-BG-Steer-West-2011	May-September	145	West	Barley silage (10); Barley grain (90)
FL-BG-Steer-East-2011	May-September	145	East	Corn silage (10); Corn grain (85); Soybean meal (5)
FL-BG-Heifer-West-2011	May-September	160	West	Barley silage (10); Barley grain (90)
FL-BG-Heifer-East-2011	May-September	160	East	Corn silage (8); Corn grain (86); Soybean meal (6)
Yearling-grass fed (backgrounded in confinement and on pasture)				
FL-GR-Steer-West-2011	September-December	100	West	Barley silage (10); Barley grain (90)
FL-GR-Steer-East-2011	September-December	100	East	Corn silage (10); Corn grain (86); Soybean meal (4)
FL-GR-Heifer-West-2011	September-December	110	West	Barley silage (10); Barley grain (90)
FL-GR-Heifer-East-2011	September-December	110	East	Corn silage (7); Corn grain (88); Soybean meal (5)

^A Numbers in parentheses are relative proportions (%) of the ingredients within the diets listed for each cattle category (on a DM basis).

^B Grass-legume hay

Note: The chemical composition of the feeds has been presented in Appendix 1.

Table S4. Feeding scenarios for breeding stock in 1981

Animal Category/ Code	Period	Duration (d)	Region	Major feeds
Lactating cows				
LactCow-WintWest-1981	April	30	West	Grass-legume hay; Barley grain
LactCow-WintEast-1981	April	30	East	Grass-legume hay; Corn grain
LactCow-GrazNative-1981	May-October	184	National	Native pasture
LactCow-GrazTame-1981	May-October	184	National	Tame pasture
Dry cows				
DryCow-earlyDrylotWest-1981	November-January	92	West	Grass hay; Barley grain
DryCow-earlyDrylotEast-1981	November-January	92	East	Grass hay; Corn grain
DryCow-lateDrylotWest-1981	February-March	59	West	Grass hay; Barley grain
DryCow-lateDrylotEast-1981	February-March	59	East	Grass hay; Corn grain
Replacement heifers				
RepHeifCalves-West-1981	November-March	151	West	Grass-legume hay; Barley grain
RepHeifCalves-East-1981	November-March	151	East	Grass-legume hay; Corn grain
RepHeif-SummerGrazNative-1981	April-October	214	National	Native pasture
RepHeif-SummerGrazTame-1981	April-October	214	National	Tame pasture
RepHeif-WintWest-1981	November-March	151	West	Grass-legume hay; Barley grain
RepHeif-WintEast-1981	November-March	151	East	Grass-legume hay; Corn grain
Bulls				
Bull-SummerGrazNative-1981	April-October	214	National	Native pasture
Bull-SummerGrazTame-1981	April-October	214	National	Tame pasture
Bull-WintWest-1981	November-March	151	West	Grass-legume hay; Barley grain
Bull-WintEast-1981	November-March	151	East	Grass-legume hay; Corn grain
Beef Calves				
Calve-SteerNative-1981	July-October	123	National	Cow milk; Native pasture
Calve-SteerTame-1981	July-October	123	National	Cow milk; Tame pasture
Calve-HeiferNative-1981	July-October	123	National	Cow milk; Native pasture
Calve-HeiferTame-1981	July-October	123	National	Cow milk; Tame pasture

Note: The chemical composition of the feeds has been presented in Appendix 1.

Table S5. Feeding scenarios for various groups of backgrounding and finishing cattle in 1981

Animal Category/ Code	Period	Duration (d)	Region	Major feeds^A
Backgrounding steers and heifers				
BG-noGR-Steer-West-1981	November-April	180	West	GLH ^B (12); Barley silage (42); Corn silage (6); Barley grain (40)
BG-noGR-Steer-East-1981	November-April	180	East	GLH (12); Corn silage (47); Corn grain (39); Soybean meal (2)
BG-noGR-Heifer-West-1981	November-April	180	West	GLH (12); Barley silage (42); Corn silage (6); Barley grain (40)
BG-noGR-Heifer-East-1981	November-April	180	East	GLH (12); Corn silage (47); Corn grain (39); Soybean meal (2)
BG-GR-Steer-West-1981	November-April	180	West	GLH (12); Barley silage (42); Corn silage (6); Barley grain (40)
BG-GR-Steer-East-1981	November-April	180	East	GLH (12); Corn silage (47); Corn grain (39); Soybean meal (2)
BG-GR-Heifer-West-1981	November-April	180	West	GLH (12); Barley silage (42); Corn silage (6); Barley grain (40)
BG-GR-Heifer-East-1981	November-April	180	East	GLH (12); Corn silage (47); Corn grain (39); Soybean meal (2)
Grassing steers and heifers				
GR-SteerNative-1981	May-September	150	National	Native pasture
GR-SteerTame-1981	May-September	150	National	Tame pasture
GR-HeiferNative-1981	May-September	150	National	Native pasture
GR-HeiferTame-1981	May-September	150	National	Tame pasture
FEEDLOT CATTLE				
Calf-fed steers and heifers				
FL-CF-Steer-West-1981	November-June	240	West	Barley silage (10); Barley grain (90)
FL-CF-Steer-East-1981	November-June	240	East	Corn silage (9.7); Corn grain (84.8); Soybean meal (5.5)
FL-CF-Heifer-West-1981	November-June	240	West	Barley silage (10); Barley grain (90)
FL-CF-Heifer-East-1981	November-June	240	East	Corn silage (11); Corn grain (83); Soybean meal (6)
Yearling-fed (backgrounded in confinement only)				
FL-BG-Steer-West-1981	May-September	150	West	Barley silage (10); Barley grain (90)
FL-BG-Steer-East-1981	May-September	150	East	Corn silage (9); Corn grain (86); Soybean meal (5)
FL-BG-Heifer-West-1981	May-September	150	West	Barley silage (10); Barley grain (90)
FL-BG-Heifer-East-1981	May-September	150	East	Corn silage (10); Corn grain (83); Soybean meal (7)
Yearling-grass fed (backgrounded in confinement and on pasture)				
FL-GR-Steer-West-1981	September-December	100	West	Barley silage (10); Barley grain (90)
FL-GR-Steer-East-1981	September-December	100	East	Corn silage (9); Corn grain (87); Soybean meal (4)
FL-GR-Heifer-West-1981	September-December	110	West	Barley silage (10); Barley grain (90)
FL-GR-Heifer-East-1981	September-December	110	East	Corn silage (9.6); Corn grain (85.6); Soybean meal (4.8)

^A Numbers in parentheses are relative proportions (%) of the ingredients within the diets listed for each cattle category (on a DM basis).

^B Grass-legume hay.

Note: The chemical composition of the feeds has been presented in Appendix 1.