

Changes in Nitrogen and Phosphorus Excretion in Vermont Dairy Herds (1999 – 2019)

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The objective of this project was to determine changes in the excretion of nitrogen (N) and phosphorus (P) into the environment from Vermont dairy herds between 1999 and 2019. This information is of importance to verify that Vermont dairy producers and the feed industry have been proactive in protecting the environment. Table 1 contains information on cow numbers, milk production, ration N and P content and N and P excretion.

Table 1. Vermont Cow Numbers, Milk Production and Nitrogen and Phosphorus Intake and Excretion

Item	1999	2019	Change, %
Number of milking cows	160,000	126,000	-21.2
Milk, lbs./cow/year	16,938	21,405	+26.3
Milk, lbs./cow/day	46.4	58.6	+26.3
Total milk production, million pounds	2,710,000	2,697,000	-4.8
Ration CP, %	18.5	16.5	-10.8
Ration P, %	0.485	0.39	-19.6
Ration DMI, lbs./day	38.5	46	+19.5
Ration N intake, g/cow/day	517	551	+6.6
Milk N, g/cow/day	104	136	+30.8
Manure N, g/cow/day	413	415	+0.5
Manure N, lbs./cow/year	332	333.6	+0.5
Total Vermont Manure N, lbs./year	53,120,000	42,033,600	-20.9
Ration P intake, g/cow/day	84.7	81.4	-3.9
Milk P, g/cow/day	18.9	23.9	+26.4
Manure P, g/cow/day	65.8	57.5	-12.6
Manure P, lbs./cow/year	52.9	46.3	-12.5
Total Vermont Manure P, lbs./year	8,464,000	5,833,800	-31

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The sources of data used to make these calculations are:

1. Cow numbers and milk production:

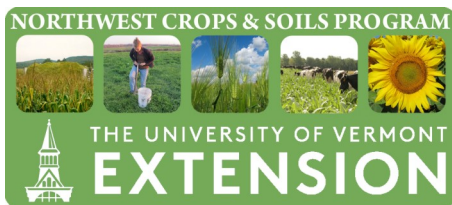
- A. 1999- New England Dairy Statistics – 2002.
- B. 2019 – USDA NASS Milk Production Report – February 20, 2020.

2. Ration phosphorus:

- A. 1999 – Paper by B.H. Anderson and F.R. Magdoff with survey data of 5 Vermont feed companies, 1 independent nutritionist and 1 university dairy nutritionist. American Journal of Alternative Agriculture 1:10-25, 2000.
- B. 2019 – 55 total mixed ration samples from Vermont dairy herds analyzed at Cumberland Valley Analytical Services in 2018-2019 plus input from 1 independent nutritionist.

3. Ration crude protein:

- A. 1999 – I was not able to find specific data for Vermont dairy herds. I used the same ration crude protein levels used in our News York paper on the same topic. This data came from herd surveys in Wisconsin, Michigan, and a multistate survey of 31 herds that I conducted. New York hers were included in the multistate survey.
- B. 2019 – The same 55 Vermont dairy herd total mixed ration samples listed above for phosphorus analysis were used.



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