

Whole-farm balances of P and K on dairy farms

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Imports and exports of phosphorus (P) and potassium (K) were monitored during a 12 mo period on 10 commercial dairy farms in Manitoba to identify best management practices (BMPs), thereby reducing the whole-farm surpluses of these nutrients. These balances were expressed per kg of milk shipped, per milking cow, and per acre. The farms differed in housing, feeding, manure management systems, and in the production and purchase of feeds. Imports included feed, bedding, animals, inorganic fertilizer, and manure. Exports included milk, animals, feed, and manure. A farm was considered to include the milking herd, the replacement herd, and the fields used to produce feed for these herds. Two farms purchased all their feed and exported all their manure.

	Minimum	Median ¹	Maximum	SD ²
Milking cows	46	82	634	237
Total animal numbers	64	213	1027	332
Landbase, ha ³	65	432	1272	446
P balance, g/kg of milk	0.3	2	10	2.7
P balance, kg/cow	4.2	23.9	101.4	28
P balance, kg/ha ³	1.0	16.0	55.3	17.6
K balance, g/kg of milk	-1.3	3.6	17.6	5.3
K balance, kg/cow	-16.9	40.5	156.4	52.4
K balance, kg/acre ³	-4.2	22.7	118.0	38.0

¹half of farms below this value; ²standard deviation

³does not include 2 farms that bought all their feed and exported all their manure

Results show that the P and K balances expressed per cow and expressed per acre varied substantially among farms. P balances were positive on all farms and the K balances were positive on all but one farm. This shows that P and K accumulated on these farms. The largest variation in the import of P and K per cow among farms was in the import of inorganic fertilizer. The largest variation in the export of P and K per cow among farms was in the export of feed from the farm. This shows that the greatest opportunity to reduce P and K balances on dairy farms is through management of inorganic fertilizer and the export of feed not that is needed for the herd.