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Nitrogen and phosphorus losses from a feedlot for suckler cows

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Abstract

The raising of cattle outdoors in winter is becoming more common in temperate areas, although there is little information available on the effects of this practice on forested areas. In this study, the concentrations of ammonium acetate extractable phosphorus (P_{AAAc}) and mineral nitrogen (NH₄-N and NO₃-N) in soil and the quality of percolation water from a feedlot were studied in eastern Finland in 1997–2000. In each of four pens (975–1300 m²) eight suckler cows were fed in winter from 1995 in the case of the first two pens and in the remaining two. The suckler cows usually stayed in the front part of the feedlot. Therefore the nutrient loading was also the highest in this part of the lot. When the pens were used for 1–2 winters, the mean contents of P_{AAAc}, NH₄-N and NO₃-N in the surface soil (0–5 cm) were 14,73 and 3.0 mg l⁻¹ respectively, compared to only 3.0, 4.2 and 0.5 mg l⁻¹ in a control forested area. In the front part of a 1-m-deep soil layer, the mean amounts of NH₄-N, and NO₃-N were 410 and 28 kg ha⁻¹ respectively after 1–2 years of use. In the percolation water, too, the mean concentrations of total phosphorus and total nitrogen were high in the front part: 1.7–2.8 and 210–1400 mg l⁻¹ respectively. The minimum cleaning of the dung, and even then loading may be substantial.

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