Dairy barns are thought to emit large amounts of ammonia. The nitrogen contained in cow urine is the major source of ammonia nitrogen.

Only approximately 20 to 35% of the nitrogen (crude protein) fed to dairy cows is converted into milk. The rest is excreted in manure (feces and urine).

Feeding nitrogen (crude protein) to dairy cows in excess of their requirements decreases the relative amount of feed nitrogen converted into milk and increases urine nitrogen excretion.

After land application, ammonia loss is less when the manure comes from cows fed a CP-adequate diet (13.6%) rather than a CP-excessive diet (19.4%).

### Abating ammonia emissions

Losses of nitrogen as ammonia gas are inevitable, but ammonia loss can be reduced through good management.

1. **Put more N into milk, not manure**

   One of the most reliable approaches to reducing ammonia emissions per unit of milk produced is to increase the level of milk production per cow. On 54 Wisconsin dairy farms, milk production and feed nitrogen use efficiency are highest on farms that: (1) use total mixed rations, (2) balance rations at least four times per year, and (3) milk three times a day.

### Three ways to reduce ammonia emissions

1. **Remove excess protein from the cow’s diet.**

   This normally saves on feed cost, as well as reducing ammonia nitrogen loss.

2. **For new construction,**

   floors that divert urine away from feces can reduce ammonia emissions. Slatted floors facilitate this.

3. **Select bedding** (e.g., sand, pine shavings) that separate feces and urine, which reduces ammonia losses.

   These three strategies could potentially reduce in-barn ammonia nitrogen loss from the current level of 10-15 kg/cow/yr to 4-8 kg/cow/yr – a 50 to 60% reduction!
References

Contact:
J. Mark Powell
U.S. Dairy Forage Research Center
mark.powell@ars.usda.gov
608-890-0070