TH256  Ammonia emissions and olfactometry analysis of limit
fed high and low concentrate diets with different forage quality in
dairy heifers.  G. J. Lascano*, P. A. Topper, A. Adviento-Borbe, D.
Topper, R. C. Brandt, E. F. Wheeler, and A. J. Heinrichs, The Pennsyl-
vania State University, University Park.

Ammonia emissions and odor are being used to regulate animal produc-
tion. The objectives of this study were to observe the effects of restricted
feeding dairy heifers high concentrate (HC) and low concentrate (LC)
diets with different forage quality on NH₃ emissions and odor. A split
plot design with diet type as the whole plot and forage quality as sub-
plot was administered in a 4-period (21 d) 4 × 4 Latin square using 8
Holstein heifers (321 ± 21 kg initial BW). Periods consisted of 17 d
adaptation and 4 d total fecal and urine collection. Corn silage-based
diets containing either 80 or 20% forage (DM basis) with 0, 20, 40 or
60% of forage provided by corn stover (CS; quality denominator) were
evaluated. NH₃ concentration was determined using an infrared photoa-
coustic gas analyzer over a 24-h period and urine:feeces as-collected from
first 2 d of total collection. Odor was evaluated by a certified panel of
human assessors utilizing a triangular forced-choice dynamic olfacto-
meter (EN 13725: 2003). NH₃ emissions were different between HC and
LC (6.98 vs. 10.57 ± 0.44 mgNH₃/g manure; P < 0.01), and decreasing
quality of forage linearly increased NH₃ emission rate on HC diets (P <
0.01). Total daily NH₃ emissions were not different between quality or
diet type. Feces:urine was lower for the HC diet (0.48 vs. 2.44 ± 0.44;
P < 0.01). More feces relative to urine (g/g) was produced as quality
of forage decreased (P < 0.01). Total manure (kg/d) was significantly
higher as forage quality increased (P < 0.01), and decreased linearly
with the addition of CS in the diets (P < 0.01). Results suggest that
odor was less offensive as forage quality decreased. We conclude that
NH₃ emissions were higher for the LC diets on a unit of manure basis,
likely due to a shift in feces:urine. Lower quality forages increased these
emissions linearly. Finally, forage quality seemed to have an effect on
odor in this study.

Key Words: Ammonia Emissions, Odor, Forage Quality