

The Effect of Cutting Time (PM vs. AM) and Swathing On the Concentration of Non Structural Carbohydrates during Wilting of Alfalfa

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Increased concentrations of non structural carbohydrates (NSC) in forages improve N use efficiency in dairy cows. We measured the changes in NSC concentration during wilting of PM- and AM-cut alfalfa. In 2008, at around the early flowering stage of development, field-grown (46°48'N; 71°23'W) alfalfa (cv. AC Caribou) was mown using a cutter bar either at 18h30 (PM) after a sunny day or at 8h30 the following morning (AM). PM- and AM-cut forage was either raked by hand in wide swath or spread (without swath), and allowed to wilt. Triplicate forage samples were taken at cutting times and every 2 hours from 8h30 until the end of the second day. This 2-day experiment was conducted twice in spring and summer, and once in fall (n = 223). Concentration of NSC (glucose + fructose + sucrose + pinitol + starch) was chemically measured in a calibration set of samples and then predicted by near infrared reflectance spectroscopy. Cutting alfalfa in PM improved NSC concentration before wilting by 17, 18, and 22 % in spring, summer, and fall, respectively. Concentration of NSC remained greater in PM- compared to AM-cut alfalfa throughout the wilting period. The rate of decrease in alfalfa NSC concentration during wilting was lower in summer and fall when wilting was faster than in spring. No swathing after cutting helps preserving NSC concentration in alfalfa forage, especially when conditions allow fast wilting. Cutting alfalfa at the end of the afternoon (16-18h00), without swathing, maximizes NSC concentration in wilted forage when climatic and crop conditions favor rapid wilting.

Implications: Cutting alfalfa in PM improves forage quality.