

**FEEDING A LOWER PROTEIN CONTENT DURING
SYNCHRONIZATION OF OVULATION AND EARLY
EMBRYONIC DEVELOPMENT TO IMPROVE
FERTILITY IN LACTATING DAIRY COWS**

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In order to achieve its milk yield potential the modern dairy cow is typically fed a diet high in protein. However, feeding protein in excess (greater than 17.5 -18% CP) causes high ammonia and urea levels in the body, which are associated with reductions in fertility, such as altered uterine pH, poor oocyte and embryo quality, corpus luteum development and reduced plasma progesterone concentrations and exacerbation of negative energy balance. Another factor that has also contributed to reduced pregnancy rates is poor expression of estrus and estrus detection efficiency and as a result estrus and ovulation synchronization protocols have been developed. Ovsynch timed artificial insemination (TAI) program allows for the control of ovarian follicular and corpus luteum development without the need for estrus detection; however, pregnancy rates achieved are still far from the satisfactory rates achieved over thirty years ago. Lactating Holstein dairy cows (n = 175) were synchronized for first service breeding using Ovsynch TAI (two treatments of GnRH, 9 d apart with a treatment of PGF2 α 48 h before the second GnRH treatment, and TAI 16-18 h later). Cows were blocked for similar parity, DIM, and milk production and then randomly assigned to continue on a high protein diet (18.5% CP), which was fed from calving, or switch to a lower protein diet (16% CP), which began 7 d before initiation of Ovsynch and continued until pregnancy diagnosis at 32 d. Groups were housed together with access to feed via Insentec electronic feed intake bins. Overall average DMI was greater for cows fed the high protein diet versus cows fed the low protein diet, throughout the entire treatment (24.3 ± 0.3 vs. 23.0 ± 0.3 kg; $P = 0.009$). Pregnancy rate was 24.4% and 34.1% ($P = 0.15$) for high and low protein groups, respectively. Parity tended to have an affect on pregnancy rate ($P = 0.09$). There were no differences in milk production between cows fed the high protein diet vs. the low protein diet. Lower milk urea nitrogen was observed while cows were fed the lower protein diet ($P = 0.02$). No differences in progesterone concentrations were observed between treatments. In summary, feeding a diet with lower protein content during synchronization and early embryonic development may increase pregnancy to TAI, with minimal effects on milk production.