transition cows vital
that was low in RUP (14% CP diets with 33.6% versus 41.4% CP of RUP). Despite the paucity of research data examining protein feeding during the first two weeks postpartum, a strong case can be made for not shortchanging cows on protein or amino acids during this period.
Figure 2 shows the potential for a negative MP balance for cows producing 60 lb. or 100 lb. of milk per day at seven or 21 days postpartum. Two different postpartum diets were evaluated using NRC (2001) recommendations: one with 15.7% CP and the other with 17.0% CP. The rumen degradable protein (RDP) content of the diets was adequate. NRC allowed estimation of dry matter intakes and MP balance. There are a few important points to note: Assuming that the NRC predictions are correct, diets will not provide sufficient MP. As the length of time postpartum increases, cows will gradually achieve MP balance due to increased feed and protein intake relative to protein requirements. However, researchers found that it is unlikely to be in a negative MP balance, and the likelihood is greater with higher levels of production. Consequently, the cow will either mobilize protein to support lactation, or milk production will be limited and below the inputs (60 lb. or 100 lb.) used for this simulation using NRC data.

Amino acid feeding
The concept of supplementing ruminally protected amino acids to improve MP balance and quality and reduce dietary CP should be as applicable to transition cows as those later in lactation. Beginning 21 days prior to the expected calving date, Ordway et al. (2009) fed heifers and mature cows a basal prepartum diet containing 13.5% CP diets averaged 1.287 mg of MP per day of MP with an average MP balance of 313 g per day, according to NRC predictions. Without additional rumen-protected methionine supplementation (control) or with additional MP-methionine, amino acids in amounts required to generate a 3:1 ratio of MP-lysine to MP-methionine.
These same dietary treatments were continued through 140 days postpartum, with the basal diet containing 16.4% CP; diets averaged 4.06 g per day of MP with an average MP balance of -145 g per day, according to NRC predictions. These researchers observed a linear response in milk protein concentration with the additional MP-methionine, suggesting that cows did benefit from an improvement in amino acid supply as the ratio of MP-lysine to MP-methionine was improved to 3.1, even on a relatively low-CP diet. Socha et al. (2005) observed that it was beneficial to supplement rumen-protected methionine and rumen-protected methionine plus lysine to cows receiving a basal diet containing 15.6% CP beginning 14 days prepartum and continuing on their respective amino acid treatments for 105 days postpartum when receiving either 16.0% and 18.5% CP diets. These researchers concluded that there was no difference between rumen-protected amino acid supplemented cows receiving a 16.0% or 18.5% CP diet, and numerically, the cows on the 16.0% CP diet consumed more dry matter, produced greater amounts of energy-corrected milk, and were more efficient at converting dietary nitrogen into milk nitrogen than cows on the 18.5% CP diet. This may indicate that the 16.0% CP diet was similar — and perhaps superior — in nutritive content to the 18.5% CP diet. Interestingly, Socha et al. increased the CP content from 16.0% to 18.5% by increasing the RDP fraction of the ration rather than the RUP fraction and concluded that this may have been the reason for the lack of difference between the diets. Indeed, the researchers have routinely observed that these dietary differences are quite common on commercial dairy farms, i.e., diets containing higher levels of CP contain higher levels of RDP than lower CP diets (less than 17.5%) probably because RDP sources have historically been less expensive than RUP sources. Given the current and, most likely, future high economic and environmental costs associated with all protein sources — both RDP and RUP — the results of Ordway et al. (2009) and Socha et al. (2005) support the concept of supplementing both rumen-protected lysine and rumen-protected methionine in transition cows diet to lower CP levels without sacrificing production or metabolic health.

Summary
Due to the high cost of protein supplements and environmental concerns with overfeeding protein, there is increasing pressure to scale back the percentage of CP in dairy diets. More research is needed, but nutritionists should carefully consider formulating diets for the post-fresh transition pens that are of higher amino acid quality relative to other stage-of-lactation diets. They should concentrate on providing sufficient amounts of RDP and fermentable carbohydrates to stimulate microbial protein production and improve the quality of RUP by providing highly digestible sources of RUP and supplementing rumen-protected amino acids such as lysine and methionine.

The concept of providing limiting amino acids is probably most applicable to the cow immediately postpartum, particularly if there is any temptation to feed lower protein diets.

Biofeeds

Biofeeds for defense
U.S. Navy Secretary Ray Mabus and Agriculture Secretary Tom Vilsack announced Dec. 5 that the Defense Logistics Agency has signed a contract to purchase 450,000 gal. of advanced drop-in biofuels, the single largest purchase of biofuels in government history.
The U.S. Department of Defense will purchase biofuels made from a blend of non-food waste (used cooking oil) from Louisiana Dyna-
mic Fuels LLC, a joint venture of Tyson Foods and Syntroleum Corp., and algae produced by Solazyme. The fuel will be used in the Navy’s demonstration Green Strike Group in the summer of 2012 during the Rim of the Pacific exercise.
Corn stover harvest
Corn farmers around Emmetsburg, Iowa, have bailed approximately 6,000 acres of corn stover residue. The bales of corn cobs and light stover will be delivered to a biomass storage site in Emmetsburg, where POET’s commercial cellulosic etha- nol biorefinery will be completed in 2013. POET is moving toward a target of 280,000 tons of biomass per year for Project LIBERTY, its 25 million gal.-per-year cellulosic ethanol plant.

Bioenergy

Corn stover harvest
Corn farmers around Emmetsburg, Iowa, have baled approximately 6,000 acres of corn stover residue. The bales of corn cobs and light stover will be delivered to a biomass storage site in Emmetsburg, where POET’s commercial cellulosic ethan- rol biorefinery will be completed in 2013. POET is moving toward a target of 280,000 tons of biomass per year for Project LIBERTY, its 25 million gal.-per-year cellulosic ethanol plant. The goal of these early harvests is to streamline the process for harvest, storage and delivery of biomass.
“Research is paramount to what we’re doing in Emmetsburg,” Proj- ect LIBERTY director Jim Sturdevant said. “Not only do we have to keep a consistent flow of biomass to the facility, (but) we need to ensure that farmers know how to harvest in a manner that maintains soil health.”

Feedstock agreement
Greenleaf Biofuels LLC announced that Tenaska Biofuels LLC has signed an exclusive multiyear agreement to supply feedstock and sell biodiesel fuel from Greenleaf’s New Haven, Conn., multiple-feed- stock plant. The agreement covers Greenleaf’s initial 10 million gal.-per-year capacity and includes options to expand the relationship. Green- leaf recently announced full funding and construction of the largest bio- fuel plant in New England.

References