**Quantitative analysis of nycterohemeral eating and ruminating patterns in beef cattle fed pelleted concentrates with or without supplemental roughage.** V Fischer [1], AG Deswysen [1], PA Dutilleul [2], CP Campbell [3] *([1] Faculty of Agricultural Sciences, Catholic University of Louvain, 1348 Louvain-la-Neuve, Belgium; [2] Dept of Plant Sci, Faculty of Agric and Environ Sci, McGill University, Quebec, H9V 3V9; [3] Dept of Animal and Poultry Sci, University of Guelph, Ontario, N1G 2W1, Canada)*

The effects of 5 diets on nycterohemeral pattern of chewing behaviour were evaluated in 10 Hereford steers in a replicated 5 x 5 latin square design (5 x 28 d). Steers were given *ad libitum* access to diets fed once daily at 09:00 h. Chewing behaviour was continuously measured for 4 d. Diets were: 1) traditional, 80% pelleted concentrate (PC; mostly ground cereals) and 20% long timothy hay (H); 2) 80% PC and 20% alfalfa cubes; 3) 90% PC and 10% alfalfa cubes; 4) a completely pelleted diet with PC and 40% corn cobs; and 5) 80% textured concentrate (mostly rolled grains) and 20% H.

Spectral analysis of hourly time spent eating and ruminating was performed using the finite Fourier transform, and allowed us to decompose the total dispersion of 24-h mastication series into 12 rhythm components (R).

Patterns of time spent eating and ruminating the 5 diets consisted mainly of R1, 2 and 3. R1 was the most important in explaining total daily dispersion of time spent eating 'traditional' (1), 'corn cobs' (4) and 'textured' (5) diets, while R1 and R3 were the most important for 'alfalfa cubes' (2, 3) diets. The relative importance (RI) of R1 for time spent eating a diet was related positively to daily voluntary intake (VI) of DM of these 5 diets ($n = 5$, $r = 0.93$, $P < 0.02$), suggesting that importance of R1, 1 cycle/d, influences significantly VI.

R1, 2, 3 and 4 contributed mostly in explaining eating and ruminating patterns of each steer. The RI of R12 of time spent ruminating by each steer was related positively to VI of DM and NDF of those 10 steers ($n = 10$; respectively, $r = 0.67$, $P < 0.04$ and $r = 0.70$, $P < 0.02$), which suggests that steers presenting a larger VI showed more daily ruminating peaks (cycles/d) than those with smaller VI, especially when they were fed diets with a larger NDF content.

**Seasonal hay intake in sheep: effects of environmental temperature and its variation.** P Prió, L Plassot, J Gasa, G Caja *(Unitat de Producció Animal, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain)*

The aim of this experiment was to evaluate the environmental effects (mainly temperature) on the prediction of forage intake of 2 types of hay in Mediterranean conditions (46°N, 2°E). The animal effect was controlled by mean of the experimental design. Twelve adult Manchega wethers were used in a triplicate (3 wethers) 4 x 4 latin square design (2 hays and 2 housing), repeated for each season throughout a whole year. The wethers were individually housed in pens placed indoors or outdoors and fed lucerne (LU) (85.6% DM; 18.9% CP and 24.7% CF, DM basis) or Italian rye-grass (RG) (83.6% DM; 14.7% CP and 27.9% CF, DM basis) hay *ad libitum*. The animals were not sheared during the experiment. In each season, every latin square (10 weeks) was centred around the equinoxes, autumn and spring, or solstices, winter and summer. Within one season each animal received both diets in the 2 housing systems. Adaptation to diet (2 weeks) or housing (1 week) was followed by a measuring week where dry matter intake (DMI), daily temperatures (minimum ($T_i$), mean ($T_m$) and maximum ($T_a$)), live weight (LW) and body condition score (BC) were recorded. Mean DMI (g/kgLW$^{0.75}$) was unaffected during autumn (70.1), winter (68.4) and spring (68.2), but decreased ($P < 0.001$; sed = 1.14) in summer (63.8). The DMI was also higher indoors (70.3) than out (64.9), although this effect only was significant for winter ($P < 0.001$) and spring ($P < 0.01$), and showed a tendency ($P < 0.10$) in autumn. Furthermore, the mean DMI was significantly higher ($P < 0.001$) for LU (73.7) than for RG (61.7). The LW (kg) was consistently higher ($P < 0.001$; sed = 0.34) indoors (83.7) than out (81.4), whereas BC was unaffected by housing. The RG intake was unrelated to any of the recorded temperatures but a significant ($P < 0.01$) relationship was found for LU (DMI = $67.6 + 0.60 T_m - 2.30(T_m - 18.7)$; $n = 32$, $R^2 = 0.23$). High temperatures ($T_m > 18.7$°C) caused heat stress, which depressed intake, mainly in summer and with year wool coats. In fact, ignoring all summer measurements, DMI and $T_m$ were unrelated in LU. In this case, DMI was still related ($P < 0.01$) to extreme daily temperatures (DMI = $83.1 - 0.79\ (T_a - T_i)$; $n = 24$,