of gestation and mo 1, 2, and 3 of lactation. Samples were composited for each cow within period. Glucose was similar among treatments ($P > 0.10$) and greater ($P < 0.001$) during gestation compared with lactation (4.33 vs 3.88 $\pm$ 0.09 mM). NEFA was unaffected by treatment ($P > 0.10$), however NEFA was greater ($P = 0.001$) during gestation compared with lactation (641.51 vs 534.98 $\pm$ 40.93 μEq/L). There was a period x treatment interaction ($P = 0.01$) for plasma urea nitrogen (PUN). PUN was higher ($P < 0.05$) for U, L, and S compared to C for mo 8, 9, 1, 2, and 3. Insulin was similar among treatments and tended to be greater ($P = 0.07$) during lactation compared with gestation (1.51 vs 1.33 $\pm$ 0.13 μIU/mL). These data suggest that DIP supplementation had no effect on blood metabolites, with the exception of PUN which was higher for U, L, and S, and insulin in beef cows consuming native prairie hay.

Key Words: Degradable Intake Protein, Beef Cows, Plasma Metabolites

Sheep Species

296 Pregnancy rates in sheep after traversing the cervix with a new transcervical artificial insemination instrument. M. C. Wulster-Radcliffe[1] and G. S. Lewis*[2], [1]*Fort Dodge Animal Health,* [2]*USDA, ARS, U.S. Sheep Experiment Station.*

The difficulty of traversing the cervix limits the use of transcervical (TC) AI in sheep. So we developed a new TC AI instrument to help remedy this. The instrument does not affect pregnancy rates through d 3 of pregnancy, but its effects on pregnancy rates after d 3 are not known. Thus, we determined whether the TC AI instrument or using the instrument for TC AI affects pregnancy rate. At 48 to 52 h after removal of progestogenated pessaries and eCG injection, estrus ewes were artificially inseminated with fresh, diluted semen, or each ewe was mated with one of several rams. Experiment 1 had three groups: 1) TC intrauterine AI using the new TC AI instrument + sham intrauterine AI via laparotomy (n = 29 ewes); 2) sham TC AI + intrauterine AI via laparotomy using a laparoscopic AI instrument (n = 29); and 3) sham TC AI + intrauterine AI via laparotomy using the new TC AI instrument (n = 30). Uteri were flushed approximately 14 d after AI. Transcervical intrauterine AI reduced pregnancy rate (17 vs 61%; [ewes with conceptus ÷ number ewes] × 100; P < 0.05), but intrauterine AI via laparotomy using the TC AI instrument improved pregnancy rate (77 vs 45%; P < 0.05). Experiment 2 had two groups: 1) sham cervical manipulation (n = 40) and 2) cervical manipulation via simulated TC AI (n = 40). Immediately after treatment, rams were allowed to breed ewes. Experiment 3 had two groups: 1) TC AI (n = 99) and 2) laparoscopic AI (n = 99). On approximately d 25 and 56 in Exp. 2 and 3, pregnancy was diagnosed ultrasonically. In Exp. 2, the TC AI instrument did not affect pregnancy rate (overall mean = 66%). In Exp. 3, pregnancy rate was less after TC AI (5 vs 45%; P < 0.01). In summary, simulated TC AI before natural service, when large numbers of undiluted sperm cells are deposited, did not affect pregnancy rate, but TC intrauterine AI, with diluted sperm, reduced pregnancy rate. Thus, TC AI with our new TC AI instrument seems to increase sperm numbers required for acceptable pregnancy rates.

Key Words: Artificial Insemination, Cervix, Sheep

297 Reproductive performance of anestrous ewes treated with used-CIDR devices and estrogen. M. Knights*, Q. S. Baptiste, and P. E. Lewis, *West Virginia University, Morgantown, West Virginia.*

Inadequate amounts or duration of progestogen pre-treatment increase the amount or estrogen required for inducing estrous behavior. Two experiments were conducted to evaluate the effects of estrogen (E) and weaning (W) on reproductive performance of ewes during the non-breeding season (early July) pre-treated with a used-controlled internal drug releasing (CIDR) device. In experiment 1, used CIDR devices (5 days) were applied to ewes for five days before introduction to rams (15:1 ewe to ram ratio). Weaned (n =105) and lactating ewes (2-3 months; n = 53) received either 0 (corn oil) or 30 ug estrogen (estradiol benzoate) 1 day after insert removal/ram introduction (IRRI). Pregnancy diagnosis was conducted by transrectal ultrasonography on d 25-30 after IRRI. Pregnancy rate to the first (PR1; 59 5 and 38 7 %) and second (PR2; 74 7 and 44 8 %) service period, percentage of ewes lambing (81 4 and 44.6 %) and lambing rate (LR; lambs born per ewe exposed, 1.26 .08 and 0.61 .11) was significantly higher in weaned ewes (P < 0.05) than in lactating ewes, respectively. LR was higher (P < 0.05) in estrogen treated than ewes treated with corn oil only, 1.1 0.1 and 0.8 0.1, respectively. Experiment 2 was similar to experiment 1 except weaned ewes (N =106) were treated with 0, 15 or 30 ug of E and lactating ewes (N = 44) were treated with either 15 or 30 ug of E. The estrous response, PR1 and percent ewes lambing and LR was significantly higher in weaned (P < 0.05) than in lactating ewes 95 5 and 73 6 %; 76 8 and 27 9 %; 82 8 and 27 9 %; 1.25 0.14 and 0.31 16, respectively. Dose of E did not modify any of the variables measured in lactating ewes. In weaned ewes E increased PR1 and percent of ewes lambing (P < 0.05). Weaning, and the use of small doses of estrogen can improve reproductive performance of ewes bred out-of-season.

Key Words: Anestrous Ewe, CIDR, Estrogen

298 Effect of dosage of Follicle Stimulating Hormone (FSH), vehicle and time of injection on ovulation rate and prolificacy in anestrous ewes. M. Knights*, Q. S. Baptiste, A. B. Dixon, E. K. Inskeep, and P. E. Lewis, *West Virginia University, Morgantown, WV.*

The effects of dosage of FSH, vehicle and time of injection on ovulation rate and prolificacy in ewes bred during the anestrous period was evaluated. During May to July, 2000, ewes (N = 445) of mixed breeding on 4 farms were treated with a CIDR-G device for 5 days and exposed to raddled rams upon removal of the insert. A 3 X 2 X 2 factorial arrangement of treatments was used to test the main effects of dosage of FSH (Folltropin; 0, 42 or 68 mg NIH-FSH-P1), vehicle (saline/propylene glycol 1:4, v:v (PGL), or 50 % polyvinnylpyrrolidone K 29-32, (PVP)) and time of injection (12 or 36 h before CIDR withdrawal/ram introduction, IRRI, d0). Growth and development of follicles were monitored by transrectal ultrasonography in a randomly selected group of ewes (n = 4/treatment group) at injection of FSH, at IRRI, and on days 1, 2, and 3 post IRRI. All ewes marked by rams were examined by transrectal ultrasonography on Days 10 to 14 and 26 to 31 to determine ovulation rate and pregnancy, respectively. Ewes were reexamined 20 to 25 days later (Days 46 to 51 after IRRI) to detect pregnancies from the second service period. The number of small follicles (4 mm) did not change over the scanning period and was not affected by any treatment. The number of medium follicles (5 mm) declined (P < 0.05) between FSH injection (1.5 0.2) and Days 1 (0.8 0.2), 2 (0.9 0.2) and 3 (0.5 0.2). The number of large follicles (> 5mm) increased from FSH injection (0.6 0.3) to IRRI (1.4 0.3; P < 0.05), and increased further between IRRI and Day1 (2.3 0.3; P < 0.05), then declined between Days 1 and 3 (0.6 0.3; P < 0.05). The number of large follicles was greater in ewes given 68 (1.9 0.2; P < 0.01) or 42 (1.5 0.2; P < 0.05) mg of FSH than in ewes not receiving FSH (0.8 0.3). Mean ovulation rate was (2.12 0.05) and was increased by increasing dosages of FSH when given 12 but not 36 h before CIDR removal (Dosage X Time, P < 0.05). Fertility variables (estrous response, conception rate, percentage of ewes lambing or prolificacy) was not affected by treatment. Dosages of FSH previously shown to induce superovulation in a portion of ewes during the breeding season failed to increase ovulation rate in different time and vehicle combinations during anestrus.

Key Words: Ovulation rate, Anestrus, FSH

299 Libido and biological parameters of mature Awassi, Awassi x Charollais and Awassi x Romanov rams. R. T. Kridli*[1], M. Momani Shaker[2], A. Y. Abdullah[1], and I. Sada[2], [1]*Jordan University of Science and Technology, Irbid/Jordan,* [2]*Czech University of Agriculture, Prague/Czech Republic.*

This study was conducted in September to compare sexual performance and biological parameters of 2-yr-old, sexually nave rams of different genotypes. Charollais and Romanov rams were imported to Jordan to improve meat production and fertility of Awassi sheep. Four rams of each Awassi (A), F1 Awassi x Charollais (AC) and F1 Awassi x Romanov (AR) genotype were subjected to sexual performance tests by being individually exposed to two estrous Awassi ewes for five 20-min periods, each 2 d apart. Body weight, body condition score (BCS) and

scrotal circumference (SC) were recorded every 2 wk for 2 mon. Rams of the AC genotype had greater BW ($P < 0.01$) than AR and A (78.7, 71.6, and 70.3 0.3 kg, respectively). Additionally, AC rams had greater SC ($P < 0.01$) than A rams and better BCS ($P < 0.01$) than AR rams. Significant correlations existed ($P < 0.001$) between BW and BCS ($r = 0.67$), BW and SC ($r = 0.79$) and between BCS and SC ($r = 0.59$). Similar leg-kicking bouts ($P > 0.05$) were observed in A and AC rams, while A rams engaged in more leg-kicking bouts ($P < 0.01$) than AR rams. Mounting frequency, raising the fat tail of females and ejaculation rate were greater ($P < 0.005$) in A than AC and AR rams. No genotype x test day interactions were detected ($P > 0.05$), however, test day influenced ($P = 0.05$) ejaculation rate. Awassi rams have more libido and showed better abilities to mate with fat-tailed females than AC and AR rams. The performance of AC and AR rams may have been improved had they been mated with docked females.

Key Words: Sheep, Sexual performance, Behavior

300 Breeding scheme for "merino branco" sheep ram lambs selection index. José Avó* and José Castro, *Universidade de Évora*.

"Merino Branco" sheep' breed is the most important of portuguese flock, and its main production is meat. The animals are well adapted to the range conditions, in the south of Portugal, showing a great variability in economical traits. In an Open Nucleus scheme, the ewes are selected by an index and the ram lambs by another index. To built the selection iondex for ram lambs, we used the traits: average daily gain during performance test (AVG), adjusted for individual weight at the begining of the test, average of three depth measures of "longissimus dorsi" at 3th lumbar vertebra and 13th rib (LDD), average of three measures of sucutaneous fat above "longissimus dorsi" (FAD), estimated carcass lean weight (CLW) and estimated carcass fat weight (CFW), at 34 Kg of live weight. We used phenotypic standard desviations and phenotypic correlations between traits from collected data and the heritabilities and genetic correlation vetween traits utilised by Simm and Dingwall (1987). We calculated the economic weights for (CLW) and (CFW) with economic penalty for fat and economiv gain for lean. To estimate lean and fat weights in the carcasses we used regression equations based on ultrasonic measurements. We obtained the index equation: I=2.85AVG-30.841LDD-196.85FAD+334.885CLW-647.72CFW with a correlation between the index and the individual genetic value rTi=178.5, a standard desviation of 178.5 and a coefficient of determination CD=60%. The carcass lean weight (CLW) is responsible for 93.4% of selection response and carcass fat weight (CFW) is only responsible for 6.6%. The other traits: (AVG), (LDD) and (FAD) don't contribute directly for selection response, but may stay in the index, because they show a selection response according the objectives of selection. For each standard desviation of the index above the mean of the group of selection candidates, we expect to have an annual genetic progress of 6.8 g on (AVG), 0.09 cm increasing on (LDD), -0.08 mm on (FAD), 0.214 Kg 0n (CLW) and -0.024 Kg on (CFW).

Key Words: ram lambs, index, genetic progress

301 An analysis of lamb price differences for West Virginia producers. D Singh*, M Knights, and D Smith, *West Virginia University, Morgantown, WV*.

The seasonal nature of reproduction in sheep results in annual production cycles that might influence supply of and prices received for lamb. To characterize the marketing environment in which WV producers operate data collected over a 7 year period (1994-2000) from 13 markets in WV was analyzed to determine the effect of year (Y), month (M), market (Ma) and lamb category (Cat) on prices and number sold. The mean price received over this period was \$1.70 0.33 /kg. Prices was significantly affected by Y ($P < 0.0001$) and was lowest in 1994 (\$1.46 0.01/kg) increased in each year until 1997 (\$1.84 0.01/kg) when prices peaked. Prices fell by \$0.24/kg in 1998 and 1999 before rising to 1997 levels in 2000 ($P < 0.05$). Prices varied significantly with M ($P < 0.001$). The highest prices ($P < 0.05$) were obtained in May (\$ 1.89 0.02/kg) followed by April and June (\$1.84 0.05/kg), and the lowest prices were received in August-October (\$1.55-1.60/kg). Lambs in Cat 5 (feeder lambs 32-39 kgs) and 6 (feeder lambs < 32 kgs) received the highest prices ($P< 0.05$; \$1.75 0.01/kg) while the lowest prices were received by lambs in Cat 3 (slaughter lambs < 39 kgs) and 4 (slaughter lambs 39-45 kgs) (\$1.50-1.60/kg). Prices were also significantly affected by market ($P < 0.01$), independent of number of lambs available for sale. The number of lamb sold was greatest in 1994 ($P < 0.05$; 15, 887) declined in 1995 but remained constant until 1999, then declined to the lowest levels observed in 2000 (10, 210). A peak in supply of lamb occurred in September ($P < 0.05$; 2161) and was consistently higher in August, October and November than other months ($P < 0.05$). Supply of lamb was lowest in the first 4 months of the year ($P < 0.05$; 218-249). Most lambs were sold as Cat 1 (slaughter lambs 45-59 kgs) ($P < 0.05$) followed by lambs in Cat 2 (slaughter lambs 39-45 kgs) and 4 (feeder lambs 39-45 kgs). The fewest lambs were sold as Cat 3 (slaughter lambs <39 kgs; $P < 0.05$). The number of lambs sold also varied significantly with market ($P < 0.001$). The results indicate annual and monthly price cycles in the lamb market exist in WV. Higher prices might be obtained by orienting production towards months when prices are highest/supply lowest, by marketing lambs based on weight and category and by selecting among available markets.

Key Words: Lamb, Price, Supply

302 Growth and immune status of orphaned lambs fed milk replacer and supplemented with fish oil or safflower oil. G. S. Lewis*[1] and M. C. Wulster-Radcliffe[2], [1]*USDA, ARS, U.S. Sheep Experiment Station,* [2]*Fort Dodge Animal Health*.

Because of recent claims that various oils can enhance immune status, the immunological effects of supplementing orphaned milk-fed lambs with oils rich in long-chain n-3 (i.e., fish oil) and n-6 (i.e., safflower oil) PUFA were investigated. From d 1 to 28 of age, lambs had ad libitum access to a commercial milk replacer, via three-nippled buckets. From d 7 to 28 of age, lambs also received one of three treatments: 1 g twice daily of either soybean oil (control), fish oil, or safflower oil per os in a gelatin capsule ($n = 60$ pens; 20 pens/treatment; one ewe and one ram with similar initial body weights/pen). On d 7, 14, 21, and 28 of age, all lambs were weighed, and jugular blood samples were collected from ram lambs. Lymphocyte proliferation in vitro, differential white blood cell (WBC) counts, and ADG were quantified. Treatment did not affect basal or mitogen-stimulated lymphocyte proliferation or ADG (445 g/pen). However, basal and mitogen-stimulated lymphocyte proliferation increased ($P < 0.05$) over time, indicating that immune competence increased during the experiment. Compared with soybean oil, fish oil and safflower oil decreased ($P < 0.05$; 43 vs 37; SEM = 1.6) the percentage of neutrophils and increased ($P < 0.05$; 47 vs 52; SEM = 1.9) the percentage of lymphocytes per 100 circulating WBC. Lymphocytes per 100 circulating WBC increased ($P < 0.05$) over time. Even though neither fish oil nor safflower oil affected lamb growth (i.e., ADG) or lymphocyte proliferation, both oils altered WBC distributions. That is, both oils increased the proportion of lymphocytes and decreased the proportion of neutrophils in circulation. In our studies with adult sheep, increased proportions of circulating lymphocytes have been associated with an increased ability to prevent infections after intrauterine inoculation with infectious bacteria. Thus, fish oil and safflower oil supplementation may enhance the ability of milk-fed lambs to control infectious bacteria, although that possibility was not tested in this experiment.

Key Words: Lamb, Immune Response, Milk Substitutes

303 Effect of age and some physiological state on seasonal wool growth and fiber diameter of Arabi breed sheep in south west of Iran. Najafgholi Dabiri*, *Shahid Chamran University, Ahwaz/Iran*.

The effects of age and physiological state (pregnancy/lactating)of ewes on seasonal wool growth rate(WGR)and fiber diameter (FD) were studied for 2 years. In 1995,48 Arabi ewes from the sheep flock of Ramin Agriculture Faculty, Shahid Chamran University in the south west of Iran were allocated in this experiment. Ewes divided into 2 equal groups of young (less than 3 years) and old (more than 3 years),(24/group). Each of these aged groups (balanced for live weight, and time of previous lambing) randomly divided into 2 equal group of dry and wet(pregnant/lactating) ewes (12/subgroup). Wet group of ewes were lambed in the early of Autumn. For a period of 2 years seasonal clean WGR and FD measured from midside patches taken every 3 months (at the end of each season). At the same time ewe live weight(LW) and body condition score (BCS)were measured. Annual fleece weight(AFW)of ewes were also measured for 2 experimental years. Ewe LW were significantly ($P<0.01$) lower for young ewes than for old ewes (49.60 ± 0.43 VS 53.50 ± 0.46 Kg). The same trend was found for ewe BCS (2.70 ± 0.05 VS

2.9±0.05). Clean WGR was significantly greater in young ewes than in old ewes (0.71±0.02 VS 0.62±0.02 mg/cm^2/d, P<0.01). The same trend was also found for AFW (2.65±0.07 VS 2.49±0.07 Kg, P<0.01). Dry ewes had significantly (P<0.01) greater LW (52.7±0.42 VS 50.40±0.47 Kg), BCS (3.3±0.05 VS 2.2±0.05),clean WGR(0.77±0.02 VS 0.60+0.02 mg/cm^2/d), FD(34.6±0.18 VS 34.0±0.21um) and AFW (2.8±0.07 VS 2.3±0.07 Kg) than comparative wet ewes. Dry ewes were compared with wet ewes in the four season of year. The measured traits particularly ewe LW and WGR were not affected by season of year in dry ewes, but these traits were lowest (P<0.01) for wet ewes during Autumn season. The lack of effect of season on dry ewes, but highly affected of wet ewes by Autumn indicates that WGR of this breed of sheep is not influenced directly by season, and the differences of WGR between Autumn and other seasons in wet ewes depends the effect of their lactating period not seasonal effect.

Key Words: Seasonal wool growth, Fiber diameter, Ewe age, Dry (non pregnant) ewes, Wet (pregnant/lactating) ewes, Fleece weight

304 Growth and carcass characteristics of Awassi, Awassi x Romanov and Awassi x Charollais ram lambs fed different planes of nutrition. A. Y. Abdullah*[1], M. Momani Shaker[2], R. T. Kridli[1], and I. Sada[2], [1]*Jordan University of Science and Technology, Irbid/Jordan,* [2]*Czech University of Agriculture, Prague/Czech Republic*.

Thirty newly weaned Awassi (A), F1 Awassi x Romanov (AR) and F1 Awassi x Charollais (AC) ram lambs of similar BW (23.9 5.8 kg) were used to evaluate growth and carcass performance on two planes of nutrition. Animals of all genotypes were randomly assigned to receive ad lib diet (TRT1) or 75% of the feed offered to TRT1 (TRT2) following a 15-d adjustment period. Animals were fed the diets for a period of 119 days. The two diets were isocaloric and isonitrogenous (16% CP and 11 MJ ME). Fifteen animals were slaughtered at the end of the experiment for body and carcass evaluation. No treatment by genotype interactions were detected (P > 0.05) in any of the measured parameters. Total feed consumption was higher (P < 0.001) in TRT1 than TRT2 animals while feed efficiency (kg feed/kg gain) was better (P < 0.05) in TRT2 animals (7.8 and 6.90.3 kg feed/kg gain for TRT1 and TRT2, respectively). Other growth parameters were not influenced by treatment (P > 0.05). Genotype, however, significantly affected final weight (P < 0.01), total gain (P < 0.001), ADG (P < 0.001), and feed efficiency (P < 0.01). Average daily gain was 198 8.3, 152.0 10.9 and 147 8.7 g/d for AR, AC and A ram lambs, respectively. Feed efficiency was 6.4 0.3, 7.8 0.4 and 7.9 0.3 kg feed/ kg gain for AR, AC and A ram lambs, respectively. Dressing percentage was influenced (P < 0.05) by genotype but not by plane of nutrition (P > 0.05). Awassi and AC had higher dressing % compared with AR ram lambs (52.1 0.9, 50.9 1.0 and 47.6 0.9 % for A, AC and AR ram lambs, respectively). Meat: bone ratio was not affected (P > 0.05) by genotype nor by plane of nutrition. In conclusion, plane of nutrition did not influence growth and carcass characteristics except for feed efficiency. Growth performance was better while dressing % was lower in AR than AC and A ram lambs due to the presence of more tail fat in A and AC.

Key Words: Growth, Sheep, Nutrition

Contemporary and Emerging Issues
Homeland Security and Animal Agriculture

305 Current thought on bioterrorism: The threat, preparedness and response. D.R. Franz*, *Southern Research Institute*.

In just the last 5 years, the public has learned of the threat of biological terrorism in America. Why biological terrorism? Why now? What is the threat, what are our vulnerabilities and how have they changed since the end of the cold war? How have international political change and biotechnological advances altered the threat? What are the technical issues for the proliferator and for the defense? What assumptions can we make about intent to harm in the post-9/11 world? A biological terrorist attack could have many faces. It might be delivered through inhaled aerosol particles, contaminated food or water, or introduced by an infected insect or animal host. It could affect humans, animals, or both. It could be based on any of hundreds of bacterial, viral or toxin agents. It might occur in any of our cities—or in our agricultural communities—at any time. Although the likelihood of occurrence is probably low, the potential for harm—and for terror—is enormous. These issues and the fundamentals of preparedness and response will be examined to put agro-terrorism in context within the broader view.

Key Words: Bioterrorism, Threat, Preparedness

306 The agroterror threat: An overview of issues and potential impacts. J. Jaax*, *Kansas State University, Manhattan KS*.

The presentation will outline a broad perspective of agroterrorism, ranging from the genesis and nature of the threat, through possible impacts upon our national interests. Key themes will be discussion of factors contributing to agricultural vulnerabilities, examination of the devastating potential economic implications of agroterrorism, and understanding posssible motivations of perpetrators. Additionally, factors that might make an agroterror event possible if not probable will be examined. Finally, some correlations and lessons learned from key past emerging disease events will be briefly discussed.

Key Words: Agroterrorism

307 Security of the food supply. G. Clarke*[1], [1]*Agriculture & Agri-Food Canada/Canadian Food Inspection Agency*.

Security of the food supply is an important issue of homeland security due to the possibility of sabotage and disruption that could occur. Steps that the food industry and government organizations, from the processor through to retail, could or are taking to deter and try to prevent incidents from occurring together with the important elements and principles involved are described. Mechanisms currently in place plus recommendations for future action to minimize disruption should an incident occur, both economic disruption and threats to public health, are also discussed.

Key Words: Security, Food

Dairy Foods
Milk Protein Gelation and Their Mixtures with Polysaccharides

308 Protein-polysaccharide interactions in emulsions and gelled emulsions. Eric Dickinson*, *University of Leeds, Leeds, United Kingdom*.

Proteins and polysaccharides are the two main classes of functional macromolecules involved in controlling stability, shelf-life and texture of dairy foods. Both act as structure-making and gelling agents in multiphase colloidal systems, and as #stabilizers# of oil-in-water emulsions. The action of milk proteins is predominantly through the formation of a macromolecular barrier at the oil#water interface. This protects droplets from sticking together by a combination of steric and electrostatic stabilization mechanisms. The action of polysaccharides (hydrocolloids) typically involves the formation of a polymeric barrier in the aqueous phase between droplets. Polysaccharides like pectin and carrageenan can affect the stability and rheology of milk protein-based emulsions in several ways. The main factors are (i) the nature of the adsorbed milk protein (caseinate, whey protein, micellar casein, etc.), (ii) the nature of the polysaccharide (degree of methoxylation of