ACTUS NUTRITION

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Review Highlights Benefits of Alpha-Lactalbumin on Sleep

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Lactoferrin Plus Vitamin C Promotes Elastin on Skin

After prior validation that sodium ascorbate (SAC) as a source of vitamin C can benefit elastin conservation and development, an ex vivo study was conducted to look at whether it would have a synergistic effect if given alongside lactoferrin. Elastin is one of the most abundant proteins in the human body and a major component of tissues such as skin, lungs, large blood vessels, and some ligaments. Freshly collected discarded human skin from 2 donors was used to evaluate the effects of lactoferrin and SAC alone and together, on elastogenesis – the production of new elastin. Four skin explants were topically subjected to the treatments daily for 7 days. One group was left untreated as a negative control. The tissue was fixed and embedded, then evaluated by immunofluorescence imaging.

Treatment with SAC and lactoferrin demonstrated a significant synergistic effect on tropoelastin (elastin precursor) stimulation compared to the single treatments. In addition, this combination demonstrated intact and increased elastin fibers in contrast to an alternative vitamin C source. The results also suggested an additive effect of SAC on increasing the presence of hyaluronic acid. This study, as part of a series of studies, validates this combination for ROS (reactive oxygen species) management and its ability to conserve and stimulate elastin. “From this current study, the combination of SAC with lactoferrin may be responsible for this additive stimulatory effect on elastin. This presents a significant advance in topical antioxidant formulations where the Vitamin C component provides antioxidant and collagen stimulation with additional elastin stimulation rather than degradation.” Widgerow et al. J Cosmet Dermatol. 2024 Mar;23(3):964-969. Epub 2024 Feb 8.

Review Highlights Benefits of Alpha-Lactalbumin on Sleep

Insufficient sleep and the problems associated with it continue to be a growing global problem. Poor sleep is associated with multiple negative health and performance outcomes, both short and long term. The amino acid tryptophan has been reported as a promising sleep-promoting nutrient, with the richest food source of tryptophan, a-lactalbumin, having some promising initial data. To enhance knowledge in the area, the current evdicence was systematically reviewed with the aim of clarifying the association between a-lactalbumin and sleep. Four clinical trial databases were searched from database inception to March 2023. Primary research articles were included if they 1. contained α-lactalbumin as an independent variable; 2. Had an outcome measure of sleep or sleepiness; and 3. participants were ≥ 18 years old. Eight studies were reviewed, with half having recruiting athletic populations and the other half involving healthy participants.

Sleep or sleepiness was measured objectively in six studies, with two studies employing polysomnography (which records brain waves, blood oxygen level, heart rate and breathing, as well as eye and leg movements). Four utilized actigraphy (wearable activity tracker) to assess sleep. Across the studies, 20-60g of a-lactalbumin was supplemented, with five studies observing a positive association between -lactalbumin and sleep. Sleep-onset latency (time taken to fall asleep) was the primary sleep metric improved following evening supplementation (within 3.5hrs of bed) of α-lactalbumin, with no studies observing any negative associations with sleep. “Data from this review suggest that individuals that have difficulty initiating sleep may benefit most from pre-sleep α-lactalbumin supplementation.”
Barnard et al. J Sleep Res. 2024 Jan 7:e14141. Epub ahead of print.

Colostrum Supplementation May Improve Post Surgery Outcomes

Post-surgery femur fracture patients are at risk of malnutrition, weight loss, disability, and mobility complications. A recent study investigated whether supplementation with colostrum would be beneficial in the present study, the role of colostrum supplementation on physical disability, and some nutritional variables after surgery was investigated. Patients were randomly assigned to two groups – 45g colostrum or 15g standard whey protein. Both supplements provided 12g protein and were consumed for 21 days. Measures were taken over 30 days, including weight, appetite, serum albumin level, hemoglobin and lymphocytes. A trend comparison during 90 days of Oswestry Disability Index (ODI) between the two groups was also calculated. Forty six patients completed the colostrum protocol while 48 completed the control (whey) protocol. There was a significant difference in weight gain within 30 days after operation between the colostrum and control groups in favor of the increase in the colostrum group. Compared to the control group, patients in the colostrum group had a higher appetite score, serum albumin level, hemoglobin level and more blood lymphocytes during the 30 days of intervention. With regards to physical function disability, patients in the colostrum group had slightly lower disability index score than the control group during the study period. This study demonstrated colostrum's potential as a post-surgery supplement with beneficial effects on appetite, hemoglobin, serum albumin level, blood lymphocytes and physical measures. Gouhari et al. Injury. 2024 Mar;55(3):111253.

Susutainability Evaluation of Plant-Based Beverages and Semi-Skimmed Milk: More Than Just a Carbon Footprint

"Developing a reliable method to compare food sustainability is gaining traction, with efforts like those by the Food and Agriculture Organization (FAO). This research aims to contribute to a comprehensive scientific comparison of food categories based on CO2 emissions linked not to weight but to their primary function: nutrient availability and uptake in the consumer's body. The study utilizes a multi-criteria evaluation for sustainability, incorporating the Nutrient Rich Food (NRF) score, protein digestibility, and essential amino acid content. A case study compares one serving of semi-skimmed milk (SSM) with various plant-based beverages (oat, soy, rice, coconut, and almond), considering their carbon footprints in relation to nutrient content and environmental costs

The analysis integrates protein quality through essential amino acid proportion and digestibility. Findings reveal that achieving an NRF11.3 score of 50 requires more servings of unfortified plant-based beverages than semi-skimmed milk, resulting in higher carbon footprints, except for soy drink. However, when considering emerging farm management measures, semi-skimmed and soy drinks show comparable carbon footprints for a given NRF score. Fortified plant-based beverages (soy, oat, and almond) exhibit lower footprints relative to the calculated NRF scores. Yet, when converting carbon footprints to euros using the European Union Emissions Trading System and adding them to retail prices per kilogram, semi-skimmed milk emerges as the option with the lowest "societal costs" (environment and consumer costs). The research underscores that understanding a food product's nutritional value requires more than knowledge of its composition; uptake into the body maintenance and potential synergistic effects of other components in the food matrix play crucial roles." de Jong et al. Sustainability. 2024; 16(5):1919.

Low Protein Infant Formula Enriches with Alpha-Lactalbumin During Early Infancy May Reduce Insulin Reistance at 12 Months

High protein intake during infancy can result in accelerated early weight gain and potentially later obesity. More advanced infant formulas aim to better match mother's milk by providing the infant's amino acid requirements in a lower amount of protein. Recently, a study completed a 12month follow-up to evaluate if modified low-protein formulas fed during early infancy had long-term effects on growth and metabolism. In a double-blinded RCT, 245 healthy-term infants received low-protein formulas with either alpha-lactalbumin-enriched whey (α-lac-EW; 1.75 g protein/100 kcal), casein glycomacropeptide-reduced whey (CGMP-RW; 1.76 g protein/100 kcal), or standard infant formula (SF; 2.2 g protein/100 kcal) between 2 and 6 months of age. Breastfed (BF) infants served as a reference. At 12 months, body composition and dietary intake were assessed, with blood being analyzed for insulin, C-peptide, and insulin-like growth factor 1 (IGF-1). Weight gain between 6 and 12 months and BMI at 12 months were higher in the SF than in the BF infants. However, there were no significant differences between the low-protein formula groups and the BF group. S-insulin and C-peptide were higher in the SF than in the BF group. Again, the lower protein groups were similar to the BF group. This study highlights that "feeding modified low-protein formula during early infancy seems to reduce insulin resistance, resulting in more similar growth, serum insulin, and C-peptide concentrations to BF infants at 6-months post intervention. Feeding modified low-protein formula during early infancy results in more similar growth, serum insulin, and C-peptide concentrations to BF infants 6-months post intervention, probably due to reduced insulin resistance in the low-protein groups." Tinghäll et al. Nutrients. 2024; 16(7):1026.

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