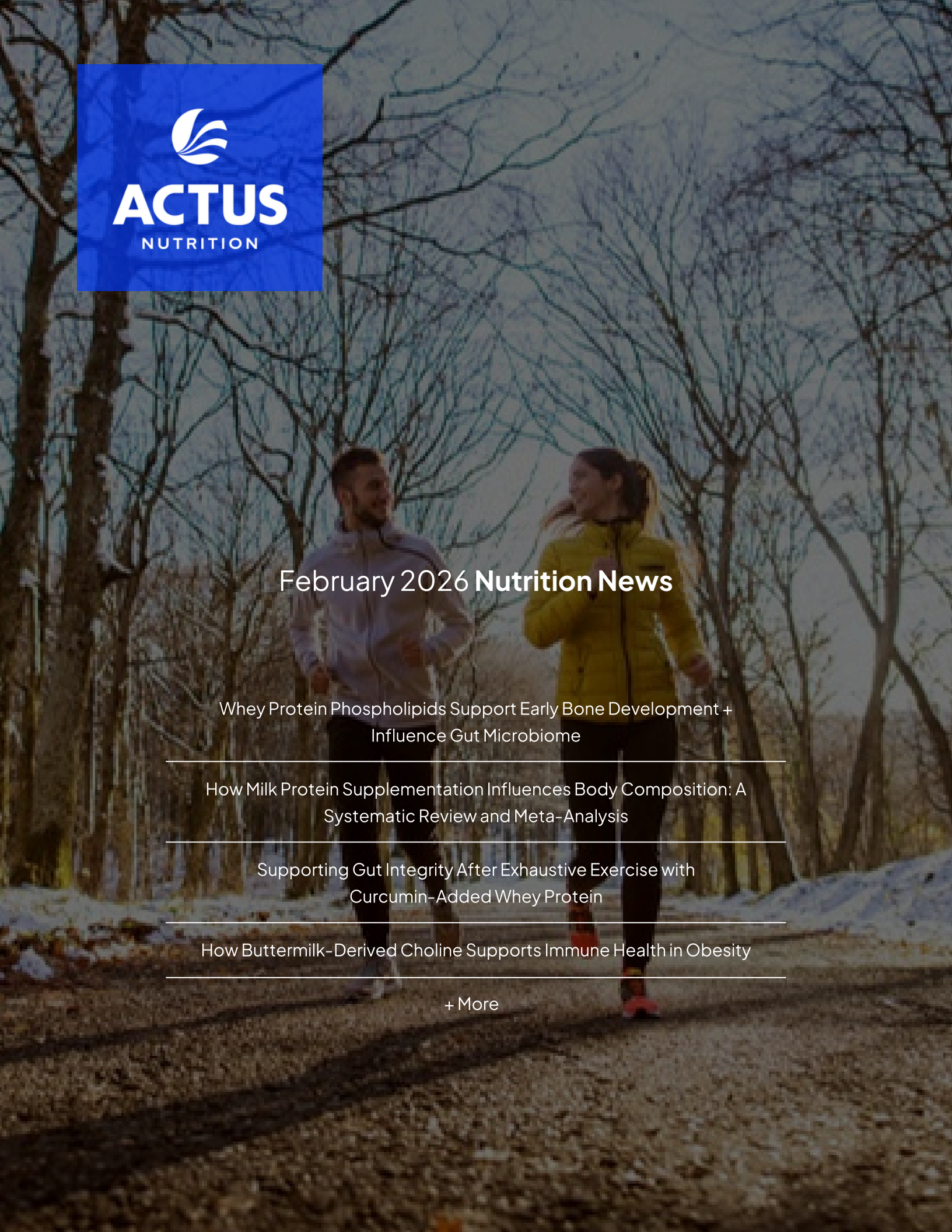

ACTUS NUTRITION

February 2026 **Nutrition News**

Whey Protein Phospholipids Support Early Bone Development + Influence Gut Microbiome

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How Milk Protein Supplementation Influences Body Composition: A Systematic Review and Meta-Analysis

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Supporting Gut Integrity After Exhaustive Exercise with Curcumin-Added Whey Protein

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How Buttermilk-Derived Choline Supports Immune Health in Obesity

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+ More

Whey Protein Phospholipids Support Early Bone Development + Influence Gut Microbiome

Early post-weaning growth represents a critical period for bone development, during which nutrition plays a key role in establishing peak bone mass. Whey protein phospholipid concentrate (WPPC), a co-product of whey protein isolate production, is rich in bioactive lipids and proteins that may support skeletal development and calcium regulation. This study examined the effects of whole WPPC and its protein- and lipid-enriched fractions on bone growth, gene expression, and gut microbiota composition in weanling mice.

WPPC was separated into lipid-rich and protein-rich fractions using temperature-dependent centrifugation, microfiltration, and ultrafiltration. These fractions were used to supplement isocaloric diets. Mice were fed diets containing either the lipid fraction (Fat), protein fraction (Protein), or whole WPPC (WPPC) at 10% of total energy (~8.7% w/w) for 12 weeks.

Compared with control animals, mice in the Protein and WPPC groups showed significantly greater femur length (increases of 4.44% and 4.01%, respectively), while mice fed the Fat fraction exhibited significantly higher bone mineral density (6.15%). Gene expression analysis of jejunal tissue revealed increased expression of calcium transporter genes (Cldn2, Cldn12, and Pmca1) in WPPC-fed mice, with no corresponding changes in vertebral markers of osteocyte differentiation. Circulating intact FGF23 levels were unchanged, indicating minimal involvement of endocrine signaling.

Analysis of gut microbiota using 16S rRNA sequencing revealed diet-specific shifts, including increased abundance of Akkermansia and Streptococcus in the WPPC group, and higher levels of Lactobacillaceae in both the Protein and Fat groups.

Supplementation with whey protein concentrate combined with curcumin helped prevent exercise-induced increases in oxidative stress and inflammation, while preserving SCFA production, antioxidant defenses, and intestinal structural integrity in rats after exhaustive exercise

Pereira et al. Br J Nutr. 2026 Jan 28;135(2):156-166

How Milk Protein Supplementation Influences Body Composition: A Systematic Review and Meta-Analysis

The effects of milk protein supplementation on body composition are still debated. This systematic review and dose-response meta-analysis examined evidence from randomized controlled trials to evaluate how milk protein overall, as well as its main components—casein and whey protein—affect body composition and related measurements.

Researchers conducted a comprehensive search of multiple scientific databases to identify randomized controlled trials published through October 2025. Random-effects statistical models were used to estimate the overall effects of milk protein supplementation on body composition and anthropometric outcomes.

A total of 150 randomized controlled trials were included. Milk protein supplementation led to significant increases in lean body mass (average increase: 0.41 kg) and fat-free mass. It also resulted in meaningful reductions in body fat percentage, fat mass, and waist circumference. Dose-response analyses showed that higher milk protein intakes were associated with significant changes in body fat percentage, lean body mass, and muscle mass.

Milk protein supplementation was associated with favorable changes in body composition, including increases in lean and fat-free mass and reductions in fat mass, body fat percentage, and waist circumference. Overall, these findings provide consistent evidence supporting the potential use of milk protein supplementation as a strategy for targeted body composition management.

Mohammadi et al. Nutrients 2025, 17, 3877

Supporting Gut Integrity After Exhaustive Exercise with Curcumin-Added Whey Protein

Intense physical exercise can negatively affect gut health by increasing intestinal permeability, inflammation, and oxidative stress, and by altering the production of short-chain fatty acids (SCFAs). Certain dietary components, such as whey protein concentrate (WPC) and curcumin (CCM), may help counteract these effects due to their antioxidant and anti-inflammatory properties. This study examined whether WPC combined with curcumin, or curcumin alone, could protect intestinal health in rats exposed to exhaustive exercise.

Forty-eight male Wistar rats (12 weeks old) were randomly assigned to six experimental groups (n = 8 per group). After four weeks on their respective diets, rats in the exhaustive exercise groups completed an exhaustive swimming test. Twenty-four hours later, all animals were euthanized. Fecal samples were collected from the cecum, and the colon was removed for further analysis. Measurements included SCFA levels, markers of oxidative stress, gene expression (via real-time PCR), and intestinal tissue structure (histomorphometry).

SCFA levels remained stable across groups, and malondialdehyde levels (a marker of lipid oxidation) did not change. However, rats receiving WPC plus curcumin showed higher levels of protein carbonylation. Nitric oxide levels decreased in the treated groups, while antioxidant enzyme activity increased in both the WPC + curcumin and curcumin-only groups, except for glutathione, which decreased. The expression of Nrf2, NF-κB, and occludin was maintained, while claudin expression increased following exhaustive exercise when WPC and curcumin were consumed together. Curcumin supplementation increased mucosal thickness and helped preserve goblet cells in the intestine.

Overall, these results show that WPPC and its enriched macronutrient fractions support skeletal development and influence calcium absorption and gut microbial composition, highlighting their potential as functional ingredients to promote bone health during early life.

Armstrong et al. FASEB J. 2025 Dec 15;39(23):e71260

How Buttermilk-Derived Choline Supports Immune Health in Obesity

Obesity is a major contributor to cardiovascular and chronic diseases and is associated with ongoing inflammation that weakens immune function. This immune dysfunction includes reduced T cell activity and lower IL-2 production, potentially driven by fat tissue inflammation, insulin resistance, and increased intestinal permeability. Choline—an essential nutrient involved in cell membranes, immune regulation, and lipid metabolism—exists in water-soluble and lipid-soluble forms. Prior preclinical research suggests lipid-soluble choline forms may better support immune function, but the role of sex differences and choline source during high-fat diet (HFD)–induced obesity remains unclear.

Buttermilk contains the milk fat globule membrane (MFGM), which is rich in lipid-soluble choline forms (phosphatidylcholine and sphingomyelin) and other bioactive compounds. This study aimed to evaluate whether buttermilk-derived, MFGM-enriched choline could improve immune function and intestinal permeability in male and female rats with diet-induced obesity.

Male and female Wistar rats were fed one of four diets for 12 weeks, all providing the same total choline (1.5 g/kg) but differing in choline form: low-fat control, high-fat control (both 100% free choline), high-fat with a dairy phospholipid extract, or high-fat with buttermilk concentrated in MFGM.

A high-fat diet impaired T cell function and increased intestinal permeability in both sexes. Diets containing dairy phospholipids or MFGM-rich buttermilk improved immune function and gut barrier integrity regardless of sex. However, the buttermilk diet produced stronger anti-inflammatory effects, including higher IL-10 production, more regulatory T cells, and reduced activation of antigen-presenting cells. Sex differences in immune profiles were observed regardless of diet, with males showing a more pro-inflammatory pattern and females a more anti-inflammatory profile.

Buttermilk-derived lipid-soluble choline helps counteract high-fat diet–induced immune dysfunction and increased intestinal permeability in both males and females. While both dairy phospholipid sources were beneficial, only buttermilk showed additional anti-inflammatory effects, suggesting that a balanced mix of lipid- and water-soluble choline forms may be optimal for immune health.

Wong, 2025

IN THE **NEWS**

New Dietary Guidelines for Americans released

January saw the release of the new DGA's, with an inverted pyramid, increased daily protein recommendation and focus on protein quality, amongst other updates. The DGAs are the federal government recommendations to help Americans eat healthier, support long-term well-being, and reduce the risk of chronic disease across the lifespan.

Whole Milk for Healthy Kids Act signed into law

President Trump signed the Whole Milk for Healthy Kids Act into law in January 2026, restoring whole and 2% milk options in U.S. school meal programs for the first time in more than a decade and reversing earlier restrictions that limited schools to low-fat or fat-free milk. The bipartisan law aligns school nutrition standards with the 2025–2030 Dietary Guidelines for Americans, expands milk choice for students, and is expected to support both child nutrition and U.S. dairy farmers. [usda.gov]

Pump up the protein: A look inside the macrotrend

The protein trend continues to accelerate, with consumers increasingly seeking high-protein products (20+ g per serving) across snacks, beverages, and everyday foods, not just supplements. Growth is being driven by convenience, taste, and indulgent formats, with bars and ready-to-drink protein beverages now outpacing powders. Protein is also gaining importance alongside GLP-1 weight-loss drugs, as consumers prioritize satiety and muscle preservation, reinforcing protein's long-term relevance

This content is provided for informational and educational purposes only and does not constitute medical advice, diagnosis, or treatment. Readers should consult a qualified healthcare professional for individual guidance.

We support the World Health Organization's recommendation that breastfeeding is the optimal source of nutrition for infants. When breastfeeding is not possible or not sufficient, infant formula can provide an appropriate alternative.

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