

The Balchem Beat

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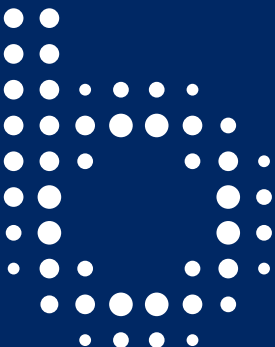
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Editor's Note

Dear Balchem Community,

Nutrition science continues to deepen our understanding of how targeted nutrients can support health across every stage of life. As consumer interest grows around healthy aging, cognitive wellness, physical performance, and personalized nutrition, researchers are uncovering new opportunities to address nutritional gaps and support long-term wellbeing.

In this issue of Balchem Beat, we explore emerging science that highlights the important role nutrition plays in helping consumers support their health and vitality. From the growing awareness of nutrient shortfalls associated with specialized dietary patterns to innovative approaches that support healthy, active aging, these insights reinforce the value of science-backed solutions in meeting evolving consumer needs. We also examine the latest market trends and research developments shaping the future of nutrition and product innovation.

As always, our goal is to provide practical scientific perspectives that help you stay informed, identify new opportunities, and create products that make a meaningful difference. We hope you enjoy this issue and find inspiration in the science driving the next generation of nutritional solutions.

**Warm regards,
The Balchem Beat Editorial Team**



Cellular Health Starts at the Epigenetic Level

At the center of cellular performance is epigenetic health, the system that determines how genes are expressed in response to nutrition, environment, and physiological demands. Cellular health is the foundation of overall wellness, supporting how the body grows, adapts, and functions over time.



While DNA remains unchanged throughout life, epigenetic mechanisms guide how cells behave, communicate, and respond to internal and external signals. These processes are essential for maintaining cellular integrity, supporting metabolic balance, and enabling long-term adaptability.

Nutrition plays a central role in this system. The nutrients we consume directly influence epigenetic pathways, helping regulate gene expression, support cellular resilience, and promote healthy aging.

Epigenetic Health Is Foundational for Cellular Health.

While our DNA sequence remains fixed, epigenetic mechanisms determine how genes are expressed, guiding how cells function, adapt, and communicate across the lifespan. Nutrition plays a central role in shaping these processes, influencing development, cellular resilience, and healthy aging.

Epigenetic health refers to the body’s ability to regulate gene expression in response to internal and external

signals such as nutrition, environment, and physiological demand. These regulatory processes help maintain cellular integrity, coordinate metabolic activity, and support long-term adaptability.

Healthy epigenetic function supports prenatal and early development, cognitive function, energy metabolism, cellular repair, and healthy aging.

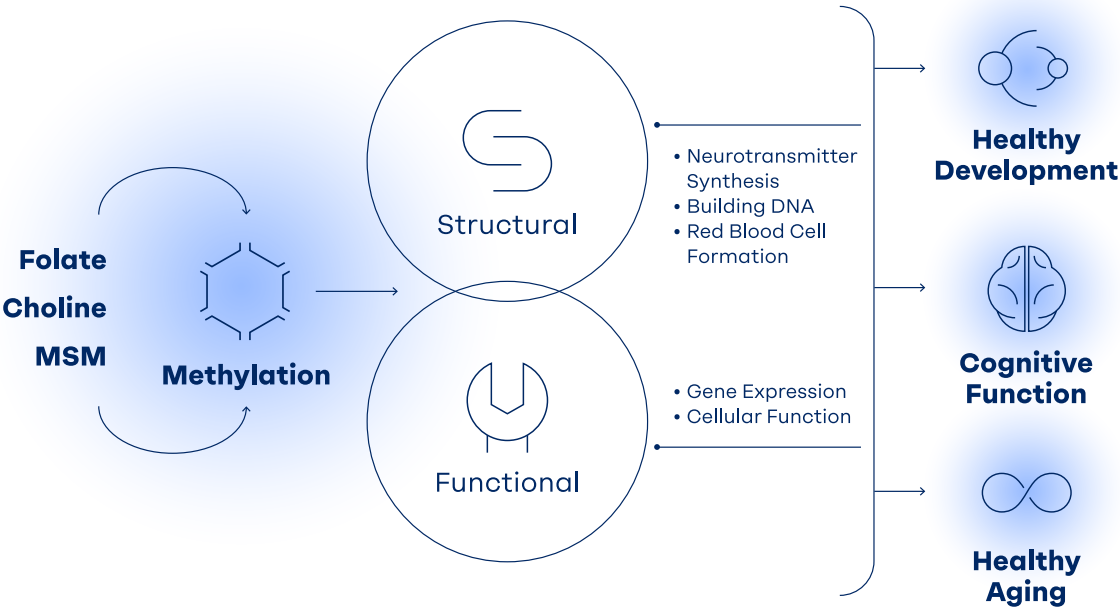
Powering Epigenetic Health with Precision

Methylation is one of the body’s most essential cellular processes, influencing how genes are expressed and how cells function over time. At its core, methylation involves the transfer of a methyl group (CH₃) to DNA, proteins, and neurotransmitters, helping regulate critical pathways tied to long-term health.

This dynamic process is shaped by environmental inputs such as nutrition, lifestyle, stress, and exposure to toxins, making targeted nutritional support especially important.

What Is Methylation?

Methylation acts as a key biochemical process within one-carbon metabolism, and is responsible for transferring methyl groups that support both structural and functional cellular needs.



Through methylation, cells are able to:

- Support neurotransmitter synthesis and signaling
- Maintain DNA & RNA integrity
- Support metabolic pathways, growth, and development
- Regulate gene expression and epigenetic patterns

Effective methylation depends on a network of nutrients that work together within one-carbon metabolism. Nutrients such as folate, choline, and sulfur play distinct, but complimentary roles in maintaining balanced methylation patterns, supporting the body's ability to respond to stressors and provide methyl availability, maintain cellular integrity, and sustain epigenetic balance across the lifespan.

Why Methylation Matters

Efficient methylation supports the body at both a cellular and systemic level. It plays a central role in processes like DNA synthesis and neurotransmitter balance, helping maintain normal cellular activity across tissues.

Methylation and Healthy Aging

As we age, natural changes in methylation patterns can occur. These shifts may influence gene expression and contribute to reduced cellular stability over time.

Emerging research in epigenetics has shown that methylation patterns are not fixed. Instead, they respond to lifestyle and nutritional inputs, and are even used to estimate biological age through epigenetic markers.

Supporting methylation through targeted nutrition can help maintain:

- Balanced gene expression
- Cellular stability
- Healthy aging processes

Science-Driven Cellular Nutrition

Balchem's ingredient solutions are designed to support foundational cellular processes and align with the body's intrinsic biology.

This approach brings together complementary nutrients to reinforce methylation and overall cellular health:

- **Optifolin+**® delivers bioactive L-5-MTHF with enhanced methyl availability
- **VitaCholine**® supports normal DNA methylation patterns
- **OptiMSM**® provides sulfur to support antioxidant pathways

These ingredients support a more comprehensive approach to cellular resilience and long-term health.

Nutritional Support for Cellular Health

Together, **OptiMSM**®, **Optifolin+**®, and **VitaCholine**® deliver a scientifically aligned portfolio of methyl donors and complementary nutrients to support cellular health across every life stage. Backed by quality, clinical research, and formulation expertise, these ingredients empower brands to develop differentiated products with confidence.

Connect with us to explore formulation support, technical data, and partnership opportunities, and discover how this integrated approach can elevate your next innovation.





Summer Grilling, Elevated: Bring Bold Flavor to Every Bite with MeatShure®

Summer is peak grilling season, and protein-packed favorites like hamburgers continue to take center stage at backyard cookouts, family gatherings, and on foodservice menus. As consumers seek bigger, bolder flavors and memorable eating experiences, processors are looking for solutions that deliver both taste and performance. That's where the MeatShure® portfolio shines.

MeatShure Encapsulated Salts help unlock rich, savory flavor while maintaining the texture consumers expect from a great burger. By controlling when salt is released during processing, MeatShure Encapsulated Salts support protein functionality and moisture retention while maximizing flavor impact in the finished product. The result is a juicy, satisfying bite with the robust taste consumers crave.

On-the-Go Protein: Meat Snack Sticks

Looking to capture the tangy, fermented flavor notes commonly associated with traditional fermented meats—without the lengthy fermentation process? MeatShure Encapsulated Acids provide an efficient alternative. These innovative ingredients enable processors to deliver authentic fermented flavor characteristics while reducing production time and complexity.

Customization is key. Whether you're seeking the bright tang of citric acid, the milder profile of lactic acid, or a carefully balanced blend of both, MeatShure Encapsulated Acids offer the flexibility to create the exact flavor profile your application demands.

From handcrafted gourmet burgers to trendy meat snack sticks, MeatShure solutions help manufacturers elevate flavor, optimize processing, and deliver a superior eating experience. This summer, fire up innovation alongside the grill and discover how MeatShure Encapsulated Salts and Acids can help create products that stand out in a crowded marketplace—one delicious bite at a time.

Let's build your next MeatShure innovation.

Contact us



Women generally synthesize less creatine endogenously and tend to consume less dietary creatine than men, resulting in lower baseline intramuscular creatine levels.



Closing the Creatine Gap: Solutions for Special Diets and Healthy, Active Aging

As eating patterns shift toward structured, goal-oriented diets, how people obtain key nutrients like creatine is changing in important ways. Creatine is an amino acid-derived compound that primarily resides in skeletal muscle, with smaller but biologically relevant pools in the brain, where it supports high, fluctuating energy demands.¹ Dietary sources are typically animal-based foods such as red meat and fish. However, many modern dietary regimens intentionally restrict these foods, which may unintentionally lower creatine exposure over time.²

Are we Getting Enough to Match Biological Demands?

A recent population-based **analysis of more than 8,400 U.S. adults adhering to a single special diet** found that low creatine intake is the rule rather than the exception. Mean creatine intake across this cohort was only 0.82 grams per day, and **69.5% of participants consumed less than 1 gram daily (the threshold the authors used to define inadequate intake)**.^{2,3}

The highest prevalence of low creatine intake occurred in individuals following low fiber diets (83.3%), high fiber diets (82.1%), gluten-free diets (79.2%), and common weight-loss regimens. Other patterns with substantial insufficiency included low fat, low salt, diabetic, and renal diets, where the proportion of people consuming less than 1 gram per day still hovered around or above 60%. Low carbohydrate diets showed a comparatively lower, though still considerable, prevalence of inadequate intake at 61.3%, likely because these plans often emphasize higher intakes of animal protein such as meat and fish.²

As creatine is naturally concentrated in animal sourced foods, individuals following specialized diets or through personal preference may have fewer opportunities to obtain creatine through a varied omnivorous diet alone. As a result, these diets may create a “creatine gap” over time.²

Creatine Beyond Athletic Performance: Lifecycle Nutrient Demands

Creatine, long recognized for its role in high intensity exercise performance, is now attracting attention in nutrition and nutraceutical science for its broader applications across diverse life stages and populations. A 2025 narrative review published in *Nutrients* reports that creatine supplementation may help support cellular energy metabolism, not only in skeletal muscle but also in other high demand tissues, including the brain.⁴

The review highlights growing interest in women, those following plant-based diets, and aging populations, who may be at higher risk for lower creatine intake.^{2,4} This also aligns with broader evidence that women generally synthesize less





“As more people adopt special diets that unintentionally limit animal-based creatine sources, targeted strategies become essential to help maintain optimal creatine status. Diets associated with insufficient creatine intake and changing lifecycle nutrient demands highlight the need for solutions such as creatine-fortified foods or well-designed supplementation protocols to bridge the “creatine gap”.²

creatine endogenously and tend to consume less dietary creatine than men, resulting in lower baseline intramuscular creatine levels. Additionally, these differences become particularly relevant during hormonally demanding phases of life, where supplementation has been investigated for its potential to alleviate fatigue-related symptoms during energy-intensive menstrual phases (early follicular and luteal), and to help counteract menopause-related changes in bone and muscle when combined with exercise.⁴ **Vegans and vegetarians whose diets contain little to no creatine show significantly reduced creatine stores**, with supplementation improving both physical and cognitive performance while supporting adherence to plant-based patterns.⁴

The review further discusses findings with epidemiologic data linking inadequate creatine intake to potential elevated risk of cardiometabolic disorders, mental health conditions, and compromised growth, emphasizing creatine’s broader role as a foundational energy supportive nutrient rather than a niche sports supplement. The review cites decades of evidence for its effectiveness and safety, with standard daily doses of 3–5 grams considered safe for healthy individuals when used as directed.⁴

Bridging the “Creatine Gap” with Creatine MagnaPower®

With changes in modern dietary patterns, and evolving evidence pointing to the importance of creatine in both performance and lifecycle nutrition, Creatine MagnaPower® offers brands a versatile and clinically proven ingredient to address emerging creatine shortfalls. By combining creatine with magnesium in a stabilized formulation, it helps deliver dual benefits for everyday energy metabolism. With formulations in functional foods and nutraceutical products for women, plant-forward consumers, active agers, and individuals focused on weight or metabolic health, we can help close the modern “creatine gap” while meeting demand for differentiated, performance nutrition solutions that position creatine as a lifelong energy nutrient, not just a sports aid.⁵

Power your next creatine innovation with Creatine MagnaPower.

Contact us



Albion®
Creatine
MagnaPower®

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Overcoming **Food & Beverage** **Formulation Challenges** with Functional Spray-Dried Powders

Consumer expectations continue to evolve, with demand growing for better-for-you indulgent snacks, unique textures, added nutrition, plant-based alternatives, and convenient formats. For manufacturers and product developers, meeting these expectations requires balancing cost pressures, processing efficiency, product stability, and speed to market.

As formulation demands increase, many brands face a variety of technical challenges, including:

- Achieving optimal texture, mouthfeel, and sensory appeal
- Maintaining product stability and processing performance
- Replacing dairy, fats, and oils — while preserving functionality
- Increasing nutrition and supporting plant-based formulation goals

Addressing these challenges often requires ingredient solutions that can deliver multiple functional benefits at once. While formulation priorities vary by category, functional spray-dried powders can help address common challenges across dairy, desserts, beverages, and snacks. They support improved processing performance, product stability, texture, and nutrition, while offering greater formulation flexibility for dairy, fat, and oil replacement, streamlined processing, and plant-based innovation.

At Balchem, we offer a wide variety of functional spray-dried powders designed to support your formulation goals, including:

- **QulC Creamer™ 7351:** Delivers fuller flavor and enhanced mouthfeel in gravies, soups, and sauces.
- **Centennial™ 73 Coconut IP2:** Improves seasoning adhesion in chips and snack applications.
- **Centennial™ 75 Palm NP:** Provides added opacity and improved stability in high-heat applications.
- **Centennial™ I Coconut:** Enhances emulsion stability and viscosity in sauces and beverages.
- **Centennial™ 7508 NG:** Adds prebiotic fiber and fat functionality to better-for-you applications.

Connect with us to learn more!





Building Better Brains with the Malawi Study



How Project Peanut Butter Supports Better Nutrition for Children with Malnutrition

Malnutrition affects millions of children worldwide, and Project Peanut Butter plays an essential role in developing effective nutrition interventions that support recovery. Project Peanut Butter empowers communities by producing ready-to-use therapeutic foods (RUTFs) and advancing research that may improve the care of children with moderate and severe acute malnutrition.

What is Project Peanut Butter and why is its mission so important?

Project Peanut Butter was established in 2004 to support children suffering from severe acute malnutrition. The organization focuses on producing locally made ready-to-use therapeutic

foods, which are designed to support recovery through essential nutrients. As a 501 c(3) charity, its work is funded through grants and individual donations, helping reach vulnerable children across Sub-Saharan Africa and beyond.

What role do RUTFs and RUSFs play in addressing malnutrition?

Ready-to-use therapeutic foods (RUTFs) and ready-to-use supplemental foods (RUSFs) are energy-dense nutrition products fortified with essential vitamins and minerals. Clinical trials led by Dr. Mark Manary demonstrated that RUTFs supported higher recovery rates compared to traditional treatments, with 75 to 95 percent of children recovering after intervention.

How does Balchem support Project Peanut Butter and the Building Better Brains study?

Balchem supports the ongoing Building Better Brains clinical trial conducted by Dr. Mark Manary. The study investigates the impact of adding choline to RUSFs to determine whether it may support neurodevelopment and help prevent the progression from moderate to severe acute malnutrition. Balchem contributes funding and provides VitaCholine® (choline chloride) material for the study.

How could choline fortification support better outcomes?

The study evaluates whether choline-fortified nutrition may support improvements in neurodevelopment scores using the Malawi Development Assessment Tool. With 2,162 children enrolled as of March 2025, findings from this research may help inform future approaches in food aid and nutritional policy.

Learn more about how Balchem is supporting global nutrition initiatives and how you can get involved.

www.projectpeanutbutter.org





From Commodity to Growth — The Rising Value of **Branded Iron**

As the dietary supplement market becomes increasingly crowded, brands are looking for ways to differentiate beyond basic nutrient claims. New market data shows that while products featuring generic iron are experiencing a slight decline, supplements featuring branded iron ingredients are gaining momentum. Specifically, product launches containing **Ferrochel® iron grew at a 5.7% CAGR** between 2021 and 2025, while launches featuring generic iron declined by 1.4% over the same period. This trend highlights a growing preference among manufacturers for clinically supported, branded ingredient solutions that can help build consumer trust and product differentiation.

Consumer demand is helping fuel this shift. According to Industry Transparency Center (ITC) survey data, the willingness to pay a premium for branded ingredients has increased steadily over the past three years. More consumers now actively seek out branded ingredients and associate them with higher quality, efficacy, and transparency. As a result, co-branding is evolving from a marketing tactic into a strategic growth driver, helping supplement manufacturers justify **premium positioning** while reinforcing credibility at the point of purchase.

For supplement brands, these trends underscore an important opportunity: branded ingredients are no longer just a quality signal—they are becoming a source of commercial value. As consumers increasingly

Between 2021 and 2025
Ferrochel® iron
grew at a CAGR of

5.7%

Source:

Innova Market Insights, Global Product Launch Data (2021–2025)
ITC 2025 Consumer Supplement Survey



look for recognizable, **science-backed ingredients**, leveraging trusted brands such as Ferrochel may help companies strengthen product differentiation, support premium pricing strategies, and create stronger connections with health-conscious consumers.

What Sales Should Know

- Generic iron launches declined slightly, while Ferrochel-branded iron launches grew nearly 6% annually from 2021–2025.
- Consumer willingness to pay a premium for branded ingredients continues to rise, supporting premium product positioning.
- Branded ingredients are increasingly viewed as both a quality marker and a business growth driver.





Events
Ahead

The
**Balchem
Beat**

Events — See You There

26—28
AUG 2026

Fi India
Mumbai, India

29—2
AUG 2026 SEPT 2026

AOAC International
Indianapolis, IN

1
SEPT 2026

Regional IFT: Lake Erie
Cleveland, OH

2—4
SEPT 2026

Vitafoods Asia
Bangkok, Thailand

9
SEPT 2026

**Protein packed:
Beyond the usual
sources**
Online webinar

16—18
SEPT 2026

Fi Asia Indonesia
Jakarta, Indonesia

17
SEPT 2026

IOF CCA Meeting
Geneva, Switzerland

6—8
OCT 2026

CRN Annual Meeting
Carlsbad, CA

15—16
OCT 2026

**1st International GVF
Symposium 2026**
Bergen, Norway

22—23
OCT 2026

**Remedy NutraFood CDMO
Conference**
Gdansk, Poland

28—30
OCT 2026

Supply Side Global
Las Vegas, NV

Schedule a meeting with us here:



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