



Leucine is Driving Milk and Meat Protein Demand



The recognition by human health professionals that leucine, an essential branched-chain amino acid (BCAA), is a key amino acid to improve muscle growth, recovery and longevity.

It is estimated by the National Milk Producers Federation that between \$8 to \$12 billion is being invested in new milk processing facilities in large part to whey protein demand.

Backed by Human and Dairy Research

What is good for a high-performance person is also good for the high-performance lactating dairy cow. Leucine has been found by both human and dairy research professionals to be a potent stimulator of protein synthesis which drives mammalian cell growth by initiating MTOR (Mechanistic Target of Rapamycin) pathway. Some of leucine's best dietary sources are dairy, meat and eggs.

"The protein signaling effects of different amino acids... so it is not just methionine, lysine and histidine anymore, there is two branched-chained amino acids leucine and isoleucine which the effects are additive to those of the limiting amino acids."

~Dr. Glen Broderick,
University of Wisconsin-Madison

Real Science Exchange Podcast,
2025 ADSA Ruminant Nutrition Symposium,
Presentation titled "Protein Analysis Methodology"

"So, the really interesting thing is as we get these cows that can make all this fat, they have the same capacity to make the protein... if we can turn this protein on... And so that's why this whole thing about why the gland decides it's okay to make fat first and not the protein is really intriguing to me. I still think it's because we're short on leucine and isoleucine. There is just not enough resources to actually make it[protein] in most of these cows today."

~Dr. Mike VanAmburgh, Cornell University

Redefining Amino Acid Impact: New Research Unveiled (UK) on The Real Science Exchange

The Importance of Leucine

"Leucine stimulates protein synthesis by activating the mTORC1 signaling pathway... making it a promising therapeutic agent for muscle growth and metabolic health."

~Dr. Shahab Ur Rehman et al., Yangzhou University

Research of Leucine in Regulating Animal Growth

"Among amino acids, leucine is really the key one. It's the amino acid that cells are most sensitive to for activating mTORC1."

~Dr. David M. Sabatini, MIT

AudioHelicase Podcast, Whitehead Institute



Human & Animal Cell Correlation

What do dairy cows and humans have in common? Both human and animal cells have essentially the same metabolic pathways to activate protein synthesis. Mammalian cells both of which protein synthesis is activated by Leucine. The conclusion is: What is good for a high performance person is also good for the high performance lactating dairy cow.



The Benefits of Leucine

- Early drivers of demand was a recognition by athletes and body builders of the benefits of leucine as a potent activator of protein synthesis.
- It not only is found to build muscle but is also used as a muscle recovery supplement after long distance and high endurance activities like biking, running and climbing.
- New research also indicates that leucine is a very important supplemental amino acid for seniors to extend muscle longevity and regrowth even with reduced physical activity.

In dairy science, **mTOR** (mechanistic Target of Rapamycin) is defined as a highly conserved serine/threonine protein kinase that acts as a nutrient-sensing master regulator of metabolism, cell growth, and proliferation in bovine mammary epithelial cells. It serves as a central intracellular hub that integrates signals from amino acids (particularly leucine), glucose availability, energy status, and hormones (insulin, IGF-I) to regulate milk protein and fat synthesis.

"Whey protein is also the best source of leucine, an amino acid that behaves more like a hormone in your body. It is more than a building block of protein-it actually activates protein synthesis. Whey protein contains 10 percent leucine while other animal-based proteins have as little as 5 percent."

~Dr. Jeff Volek, PH.D. R.D.

Men's Health Interview, Protein and Muscle Guide,
February 2, 2025

"Leucine is considered to be the most potent of the three BCAAs... it increases protein synthesis and muscle growth by activating the mammalian target of rapamycin (mTOR)."

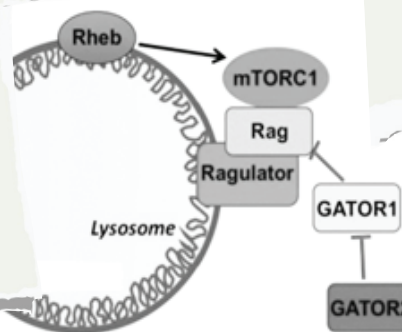
~Matt Weik, BS, CSCS, CPT, CSN

Benefits of High Dose of Leucine for Increased mTOR

"It's very clear that mTOR is amino acid driven. In fact, David Sabatini and his group at MIT published a paper identifying leucine as the highest affinity amino acid sensor for mTORC1."

~Dr. Peter Attia, M.D.

How AA Leucine Drives mTOR

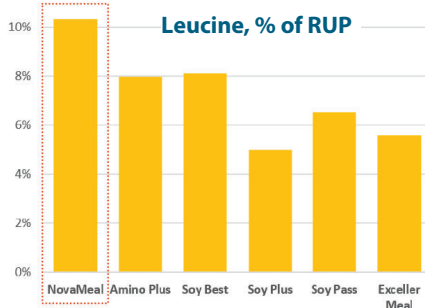


A potent stimulator of protein synthesis which drives mammalian cell growth by initiating mTOR pathway.

Leucine

New Research on Branched Chain Amino Acids

Gallagher et al. Journal of Animal Science and Biotechnology (2024) 15:13



BCAA supplementation in this study improved milk production and the importance of the BCAA being in the RUP fraction.

NovaMeal is high in RUP and high in the branch chained amino acids, especially leucine a potent stimulator of protein synthesis, compared to other bypass protein.

View the study and research brief at:
www.NovaMeal.com/research-resources

Source: Values from competing products taken from manufacturer specification sheets and CNCPS 6.55.

www.NovaMeal.com

The Correlation to NovaMeal

NovaMeal is the best source of bypass leucine compared to other bypass proteins. Plus it is a good source of other essential amino acids.

