PRONATIV®

Native Whey Protein

The Ultimate Guide for Functional Food & Supplement Manufacturers

LACTALIS ingredients®

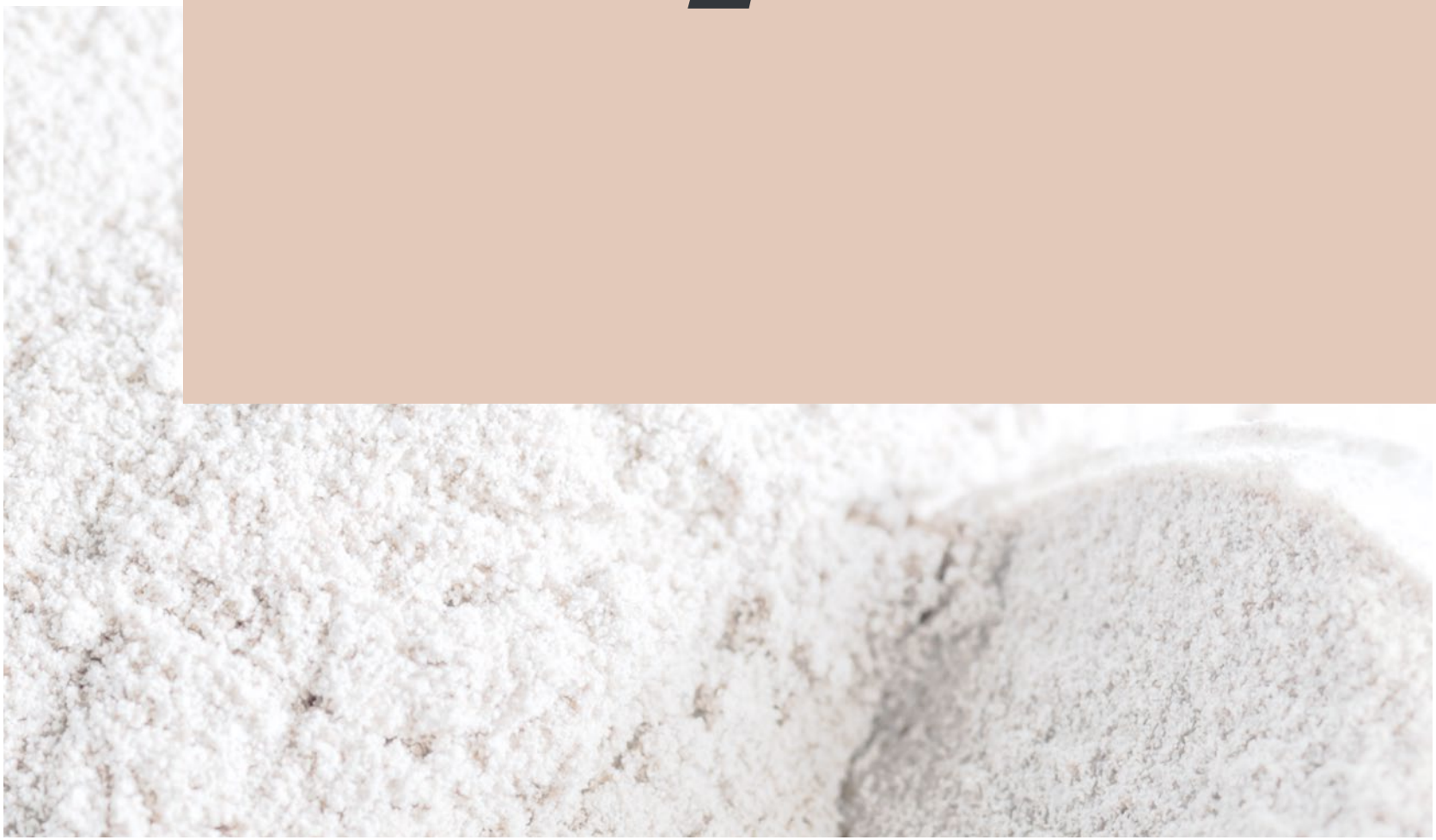
Few markets are as saturated as the functional protein & supplement field. With thousands of products, competitive pricing and overstocked shelves, standing out and succeeding is an uphill climb. In this guide, we look at how native whey protein is changing the game and transforming the way consumers and brands think about protein.

Native whey protein is a newer, less processed form of protein that can optimize protein synthesis and muscle function compared to other protein sources. And although its potential is still being understood, the current response to native whey suggests it's well positioned to be a rising trend in protein-based supplements and functional nutrition.

But its distinctiveness also means an entirely different approach is required to understand, formulate, brand and market native whey products.

In the following guide, we attempt to answer some of the questions surrounding native whey protein – what it is, how it works and how it benefits functional food and supplement manufacturers and their consumers.

Chapter 1



Native whey protein (NWP) is a pure, green, minimally-processed protein that offers a neutral taste and more nutritional value compared to traditional whey and alternative protein products. Native whey is the whey protein naturally present in fresh milk and isn't a byproduct of the production of other products. And it's made exclusively using physical manufacturing processes. No chemical processing or added ingredients are used.

For fitness enthusiasts looking for healthy and more natural protein sources – and the manufacturers looking to serve them – native whey offers a premium recovery option with a number of powerful benefits.

Nutritional Benefits

FASTER RECOVERY

Proper intake of protein is essential for any health regimen, particularly after a workout. Native way absorbs faster than other protein sources, allowing consumers to recover faster.

For example, a study of Pronativ, an NWP manufacturer, found that the product optimized protein synthesis and muscle function, which could help enthusiasts and athletes build back stronger.

Other studies have also shown Pronativ NWP can promote faster neuromuscular adaptations after training than standard whey proteins.

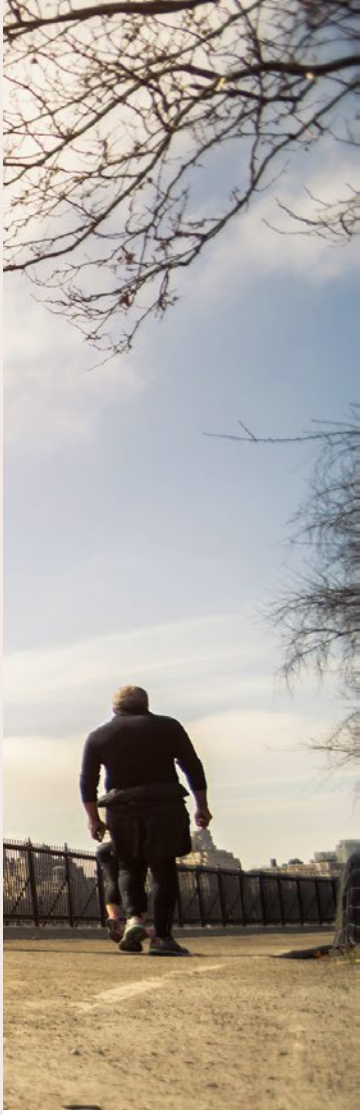
STRONGER AMINO ACID PRODUCTION

Due to the cold-filtration process, NWP is a complete protein that is naturally rich in essential amino acids that the body cannot synthesize. This includes Leucine, which is vital in muscle synthesis and up to 17% higher in NWP versus a traditional whey protein.

NWP is also far more efficient for muscle cells than amino acids added directly to a traditional whey protein. Its higher bioavailable leucine and unique amino acid composition help to trigger and support muscle protein synthesis.

Key Amino Acids	*g/100g Protein*
Histidine	2.2
Isoleucine*	6
Leucine*	13.1
Lysine	10.6
Phenylalanine	4
Threonine	5.5
Valine*	5.8
Tryptophan	2.5
Cysteine	3.1
Methionine	2.5

*BCAA



Protein Availability

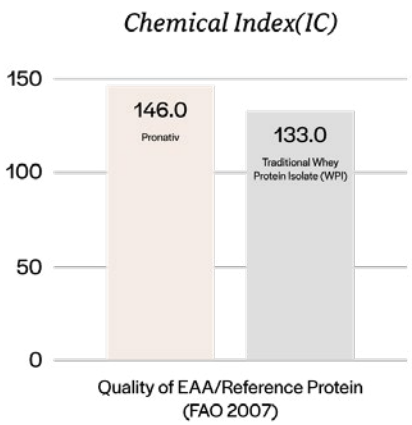
Providing high-quality protein with the right ratio of essential amino acids (EAA) is key. However, these nutrients need to be digested to be available and effective for your muscle cells. NWP is efficiently digested and has higher capacity to provide the right ratio of amino acids to support body functions compared to other proteins.

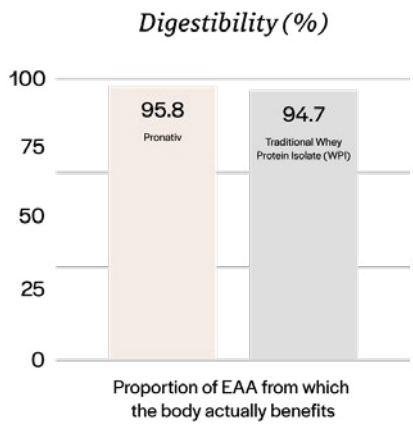
Protein availability is measured by three values:

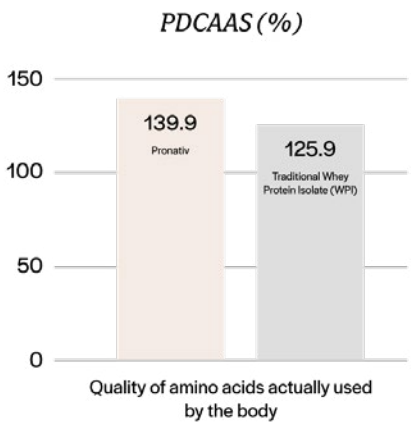
- **Chemical Index:** Protein capacity to provide to the body all the amino acids in the right proportions to support good body functions.
- **Digestibility:** Proportion of protein available for the body after digestion; it takes into consideration what is rejected (waste - protein not being used by the body).
- **PDCAAS:** Indicator of the available ideal amino acid profile that can be used by the body. Calculated by multiplying the Chemical Index by Digestibility.

In a study of these indexes, NWP exceeded traditional whey protein isolate in every category. Because of this, NWP has more of what your body uses and less of what it can't process.

While plant based protein was not a part of the study, research indicates that Pea protein has a PDCAAS of 90 and rice protein has a PDCAAS of 41.







Less Protein for the Same Results

Protein intake has been shown to facilitate weight loss. But a common consumer concern is that the added calories in protein supplements increase their overall caloric intake.

Native whey has a higher purity level of 95% protein on a dry basis and superior bioavailability, allowing the body to more effectively utilize it. This means that you can eat less protein and achieve the same results compared to traditional whey products.

Studies have shown that 15g of NWP activates the same level of muscle protein synthesis as 30g of other proteins. Because of this, the calories in a serving of NWP is only 65 calories, significantly lower than the 210 calories found in most servings of traditional whey protein. This enables weight-conscious consumers to get the benefits of activating muscle protein synthesis with 69% fewer calories.

This represents a fundamental shift in the way customers think about consuming protein. While traditional protein sources rely on quantity and price, NWP represents a shift towards quality and effectiveness.

Chapter 2

NWP offers a number of health and lifestyle benefits for consumers. But the biggest differentiator is its natural manufacturing process. But to understand that, we must first examine how other proteins are made.

Traditional Whey Protein Manufacturing

Traditional whey protein is the most common ingredient in protein powders because of its high quality amino acid profile. But whey protein is produced as a byproduct of cheese manufacturing and undergoes extensive processing, including:

1 Multi-site Heat Treatments

2 Chemical Reactions

3 Enzymatic Reactions

4 Filtrations

5 Drying

This heavy processing might alter the quality and chemistry of the protein. The result is a powder containing protein, but one likely to contain production residues, sugar, fats, bacteria and residual chemicals, changing the original nutritional form and benefits of the whey protein.

But the manufacturing processes not only could impair the profile and effectiveness of the proteins – they could cause concerns for consumer health.

The several processing steps of traditional whey protein can make it more difficult to digest. Consumers of whey protein frequently report side effects such as bloating, gas and stomach cramps. And studies have shown high consumption of processed whey can cause digestive distress, nausea, loss of appetite, acne, headaches and fatigue.

Despite strong nutritional benefits, years of science and being a pioneer in the supplements market, consumers have raised concerns about the above health findings. Personal beliefs like vegetarian and vegan diets are also pushing consumers to reconsider their current protein sources. This has led many of them to turn to alternative protein sources, like plant-based powders and NWP.

Plant-Based Protein Manufacturing

The first place many consumers turn when looking for an alternative protein is that of the plant-based variety. The assumption here is that these proteins are more natural and less processed because they come from plants. But the truth is far more complicated.

Extracting protein from plants in a solid state is extremely difficult. As a result, isolated plant proteins are heavily processed with heat treatment and chemical agents.

While it's not the case for all plant proteins, some distributors of plant protein confirm that the process of plant protein is not always local. Plants are grown in the US in the United States and then shipped to China. There, the protein is extracted with solvents that aren't approved for use in the US, and then shipped back to the states for manufacturing.

This production approach is also highly unsustainable, incurring a large carbon footprint during transportation.

Regardless of where the protein is manufactured, the process is intense. The extraction of plan proteins can introduce a lot of unnecessary chemicals and processing.

Beyond the heavy processing steps, plant proteins also do not provide the complete amino acid profiles necessary to stimulate muscle growth. Unfortunately, though, because plant proteins are perceived as being more natural and greener, it's easier for consumers to avoid taking a deeper look. In spite of lower nutritional value and lack of science showing benefits, the plant protein market continues to grow.

At the same time, some consumers are continuing to look for a protein that not only seems more sustainable, but is actually natural, healthy and sustainable.

NWP Manufacturing

Compared to traditional whey and plant proteins, NWP manufacturing is far more minimal. Case in point, whereas traditional whey protein processing requires multiple steps, native whey requires only three:

1. Milk preparation pasteurization
2. Cold membrane filtration
3. Drying

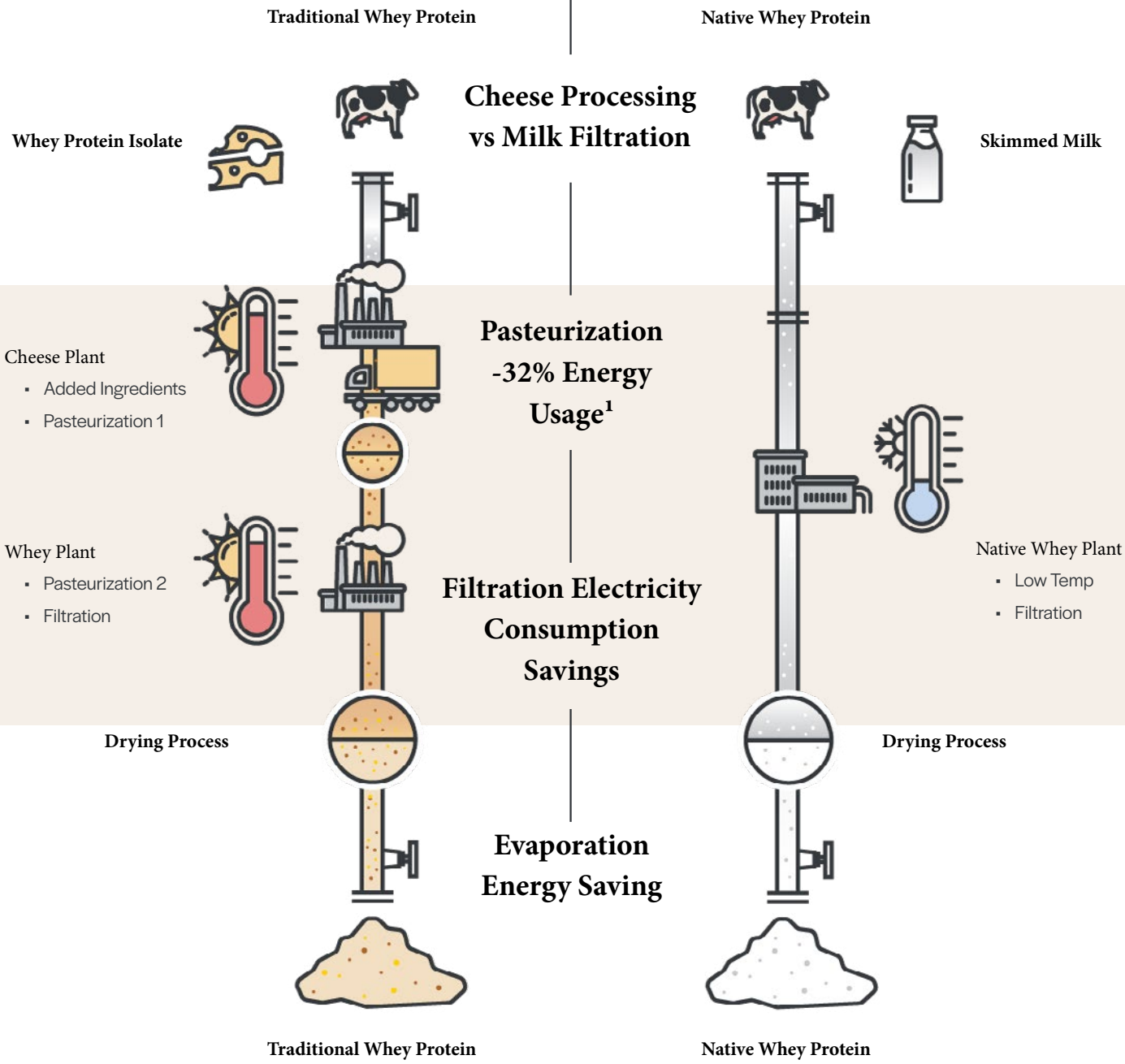
This process is extremely gentle, using only cold filtration from milk and drying. And some manufacturers will even go a step farther by only using milk locally sourced from farms near the manufacturing plant.

Regardless, the result is not a byproduct of cheese production, results in absence of added chemicals and is derived from a single ingredient: milk. This minimal processing preserves the native form of the protein and its nutritional benefits.

For consumers looking for efficacy and naturality in their protein, NWP has surfaced as a powerful alternative to regular whey and plant protein.

NWP vs. Traditional Whey

To understand the difference between NWP and traditional whey protein, you need to see the differences in how they're made. In the infographic below, we compare the manufacturing steps for each protein.



[1] Values linked to data from specific plants.

Summary

So far, we've looked a chemical makeup, digestibility, PDCAAS, and differences in manufacturing process. All of this data indicates that, not only is NWP more efficient, but NWP provides greater nutritional value. And what it takes to acquire that nutritional value is obtained with greener processes.

The table below provides an overview of the overall benefits and points of differentiation between protein sources. Because there are many different sources for plant protein, we've used pea protein as an example.

	Native Whey Protein	*Whey Protein*	*Plant Protein (Pea)*
Nutritional Benefits	▪ Complete Amino acid profile ▪ 17% leucine than whey ▪ Bioavailable leucine and unique amino acid composition trigger and support muscle protein synthesis ▪ Only 15g of protein required	▪ Complete Amino acid profile ▪ High level of leucine ▪ Lower leucine bioavailability ▪ 30g of protein required	▪ Incomplete amino acid profile ▪ Lower leucine levels ▪ Lower leucine bioavailability ▪ 40g of protein required ▪ Requires blending with other plant protein sources
Amino Acid Profile	Complete	Complete	Incomplete
Protein Availability (PDCAAS)	139.9	125.9	90
Sustainability	▪ Local processing ▪ Milk is the only raw material ▪ Minimal fossil fuel consumption transporting milk to processing plant	▪ Byproduct of cheese manufacturing ▪ Undergoes extensive and less sustainable processing	▪ Might involve transportation between countries for processing, which consumes fossil fuels ▪ Raw materials are often fragile and less fresh due to extensive transportation
Process	▪ Cold physical separation ▪ No added ingredients ▪ No added chemicals	▪ Involves enzymatic, acidic or solvent extractions	▪ From the crops to the flour, followed by acidic, enzymatic or solvent extractions

Chapter 5

So far, we've reviewed the differences between the protein ingredients. But research has shown that the disparity doesn't stop at the ingredient and processing level.

The manufacturing of protein supplements isn't consistently regulated by the Food & Drug Administration (FDA). As a result, traditional whey and plant protein ingredients might end up up in products that contain low to medium levels of harmful chemicals.

For example, a report on whey protein products by the Clean Label Project found:

- **10%** whey-based protein powders contained lead levels above health guidelines.
- **28 out of 134** of the protein powders contained twice the regulatory limit (3 micrograms) of BPA, a known endocrine disruptor.
- **Some powders** contained high levels of lead, BPA, mercury, cadmium and arsenic – substances which have been linked to multiple cancers, reproductive harm and brain damage.

The findings of the same CLP study found even higher toxin levels in plant-based protein products:

- **Approximately 75%** of plant-based proteins tested had measurable levels of lead. The laboratory discovered the plant-based protein powders each contained on average twice the amount of lead per serving comparted to other products.
- **In addition to lead**, the plant-based protein powders contained mercury, cadmium and arsenic, in quantities that in several cases exceeded health-based guidelines.
- **55%** of plant protein powders tested had measurable levels of BPA.
- **Certified organic** products averaged twice as many heavy metals.

So, what do the above numbers indicate? In short, not all whey proteins are created equal. Because while most traditional whey protein do not contain high levels of lead or cadmium or arsenic, there is broad disparity when it comes to production processing and "standard" practices. This not only impacts traceability, but also increases the risk of contamination, be it inadvertent or not.

So, it's important to align yourself with an ethical producer who is willing to share their traceability process from farms to protein ingredient. Sourcing direct from the manufacturer, rather than through re-sellers and distributors, is one way to help ensure that the products you source are safe and unadulterated.

However you source ingredients, the takeaway here is clear: As a functional food manufacturer, it's in your best interest to do your due diligence and find a quality partner. Because if you want a clean and pure product, you need to start with clean and pure ingredients.

As we'll see in the following sections, this has created an opportunity for manufacturers to stand out with clean, minimally processed protein ingredients.

Chapter 4

Traditional whey protein is the dominant force in the supplements market. But there's a growing demographic of conscious consumers looking for products that provide transparency and more health-minded benefits.

Even without strong scientific evidence regarding its efficacy, the $16 billion plant protein market is testament to the fact that consumers want alternatives.

This presents a tremendous opportunity for protein manufacturers. As consumers search for alternatives to heavily processed protein, NWP has emerged as an answer to that demand.

This has created plenty of room for manufacturers to find customers with differentiated approach and unique selling points. But to take advantage of this trend, you'll need an understanding of consumer wants and how markets vary throughout the world.

What Do Consumers Want?

As we've reviewed, consumers are looking for more natural and easily digestible protein sources. But this demand has also intersected with other consumer trends, including transparency and sustainability.

As such, the interests of consumers are far-reaching:

- Naturality
- Premium offerings
- Safe, fresh and ethically sourced ingredients
- Ingredient transparency
- Minimal processing
- No toxins, metals or added chemicals
- Manufacturing and processing transparency
- Easy to use
- Palatability for easy digestion
- Solubility for ease of use
- Better tasting protein products
- Efficacy and nutritional benefits
- Clearer, science-backed health benefits
- Lower calorie options

While these demands are diverse, a few things are abundantly clear: Consumers want higher quality products and a more natural way to achieve their protein goals. This is one of the biggest reasons native whey is gaining steam for manufactures.

The European Market

The American market is the leader in setting trends for sports-and-active-lifestyle nutrition products. Consumer trends, demands and products primarily start in the U.S. and cross over to Europe. Within that market, the United Kingdom and Germany are the leaders, followed by Spain, Italy and the Nordic countries. And France is a small market for sports nutrition.

But for native whey, the dynamic is reversed. Awareness of NWP in the European market is significantly higher than in North America. And several French manufacturers are at the forefront of production. There are a number of reasons for this.

LESS COMPETITION

The European market is a less mature market, with fewer supplement users and high protein products available than in the U.S. As such, there are fewer established brands selling traditional whey protein and lower barriers to entry for up-and-comers. This environment has created room for manufacturers to launch and differentiate premium native whey products without the typical constraints found in the U.S market.

PROTEIN PURITY

Consumers in Europe have demonstrated a strong interest in protein without lactose. Recent research shows that lactose intolerance is very common, affecting 20-79% of people, depending on ethnicity and ancestry. As such, many European consumers are turning to native whey to get the benefits of whey protein without lactose. Because NWP is so pure, the protein contains less lactose, fat and bacteriological residues than in other proteins.

WHAT "NATIVE" MEANS

The term "native" is resonating better with consumers in the European market. For linguistic and cultural reasons, "native" has a direct link to "natural," making it sound healthier and more in line with their expectations. It represents quality and answers overall concerns regarding clean products, minimal processing and zero additives.

ROOM FOR EDUCATION

The European market for native whey has also had time to develop. Manufacturers first started producing native whey in France 15 years ago. From there, the market expanded to the rest of Europe.

This has allowed ample time for the market to develop. And European manufacturers have been educating European consumers about the science and benefits of native whey for a longer time. While the market is still young and meaningful data has yet to be produced, some estimates indicate Europe may make up 70% of the global market for NWP.

The North American Market

The United States is the global leader in sports and active nutrition, owning about 60% of global market share. This has led the North American whey protein market to become highly saturated, competitive and price-driven.

Additionally, the widespread popularity of traditional whey has contributed to a lack of awareness for NWP in the North American market. Education is just starting and the first American clinical study was recently published in March 2020.

From 2007 to 2010, ingredient manufacturers tried to introduce native whey into the U.S. market. But manufacturers felt the market was not ready for a premium ingredient without strong scientific evidence of nutritional superiority.

It was then reintroduced in 2015, this time with a more scientific, evidence-based approach that relied on clinical studies proving its efficacy for manufacturers and consumers. Sales started perking up as imports from France to the North American market increased. North American production of NWP soon followed in 2016, allowing manufacturers to purchase ingredients domestically.

Today, the American native whey market is still evolving, presenting both challenges and opportunities for manufacturers.

The average athlete or fitness enthusiast in the U.S. isn't familiar with the benefits of native whey. New entrants to the space will have to market to the right audience with the right message. This requires identifying niche value propositions messaging and benefits that resonate with a targeted audience.

On the other side of that challenge lies an opportunity. The American whey protein market is deeply saturated. But the market segment for premium, natural and quality protein supplements is largely untapped. As such, manufacturers entering the market will face less competition while simultaneously exposing their products to an entirely new demographic of users.

Chapter 5

Benefits for Manufacturers

In a market as competitive as protein supplements, creating products that can still stand out and build a following is costly and requires years of R&D.

Unless of course you have newer ingredients.

More supplement and functional food manufacturers are turning to native whey simply because it allows a measure of instant differentiation for their products. With native whey, you can create a unique, premium product that you can be transparent about for consumers. And with the market still maturing, the manufacturers that are currently exploring how to innovate with NWP will wield a strong advantage over late adopters.

Because when you formulate products with native whey, you can be more up front with how you market them. This means you can make claims such as:

NATURALITY & SUSTAINABILITY

- No chemicals, heavy metals or toxins
- Sustainably-produced with less energy
- Green processing

PROTEIN PURITY & NUTRITION

- Up to 95% protein
- Lactose free
- Neutral and/or better taste
- Fewer additives and fillers
- Higher nutritional quality

EFFICACY

- Better protein digestibility
- Lower calories
- Clinically proven
- Fast absorption

Applications for NWP

Working with NWP provides a way to formulate and introduce new products that wouldn't be possible with other protein sources. Here are some of the ways leading manufacturers are working with it.

POWDERED BEVERAGES

So far, manufacturers are primarily using NWP to formulate powdered beverages. There are two routes you can take. The first is to take advantage of NWP's higher efficacy to create effective protein supplements with lower quantities of protein.

However, this message often doesn't resonate with high protein users because they respond more to quantity – as in grams of protein – than the quality and efficiency. Some brands are getting around this by blending NWP with other protein sources to optimize margins while reaching a bigger demographic.

The second option is to develop a premium powdered beverage marketed as containing native whey. This enables manufacturers to highlight the unique benefits of NWP while targeting specific segments of the sports nutrition powder category, which is the largest and easiest application to formulate for.

PROTEIN BARS & READY-TO-DRINK SHAKES

Leading manufacturers are also using native whey to produce premium offerings for protein bars and ready-to-drink shakes. Though it may require additional technical knowledge and other sources of protein to formulate, adding native whey to these products offers consumers and manufacturers the same benefits as powdered applications.

CO-BRANDED PRODUCTS

Another NWP application is to develop co-branded products with ingredient manufacturers. Many small and medium-sized manufacturers use this approach as it provides the credentialing of a recognized brand on their packaging while also highlighting the science, benefits and uniqueness of the protein.

6 Chapter

WHAT'S NEXT FOR MANUFACTURERS?

Now that you're familiar with the benefits and science behind NWP, you're probably wondering how to start formulating with it. With that in mind, let's look at how to get started.

Where Can You Source Native Whey?

Because NWP is a maturing market, there are fewer manufacturers to choose from than with traditional whey.

The numbers are particularly small in the U.S. For years Pronativ made by Lactalis Ingredients was the only manufacturer serving the market. In recent years the number of ingredient manufacturers available for retail brands has grown significantly, with new American manufacturers breaking ground and European producers exporting NWP overseas.

Getting Started With Native Whey

Native whey is a unique ingredient product that has a number of unique traits to keep in mind during the formulation process.

It's pure and has a clean, natural and white coloration that is different than what most manufacturers are used to working with. Its higher efficacy also means it requires less product to achieve the same effect as other proteins.

The main thing to keep in mind is that native whey products are a brand new option for consumers and offer distinct value. Homing in on the right benefits is essential.

That said, the formulation process for NWP is similar to any other protein ingredient. It just requires additional steps to understand and accentuate the benefits.

Conclusion

Native whey is changing the way consumers and brands think about protein. At its core, it's a simpler, healthier protein that offers a range of benefits for a wide swathe of needs. No other source of protein offers the same combination of nutrition, science, sustainability, efficacy and naturality.

And consumers are ready for it. They want more effective, more transparent and better-tasting protein products. And they want those products to help them meet whatever health and fitness goals they have faster and easier. The market is growing fast. But it's loaded with opportunity for brands and manufacturers alike. Good luck.