



# ColostrumOne™

Nature's Superfood

**The World's Premier Source  
of Bovine Colostrum**

# The Gold Standard



## THE PRODUCT

ColostrumOne™ is nature's superfood. Designed to be comprehensive as nature intended with the important nutritional components for health and vitality throughout all stages of life

## THE COMPANY

PanTheryx™ – the Premier Source and Largest Supplier with over 35 Years Experience

## THE OPPORTUNITY

Used in multiple product categories to support human and animal health



Gut  
Health



Immune  
Support



Sports  
Nutrition



Skin  
Health



Functional Food  
& Beverages



**PanTheryx™**

**The Global Leader With Over 35 Years Experience**

**1984**

La Belle™ & Associates Established in Bellingham WA



**1999**

La Belle Opens 2<sup>nd</sup> Facility in Ripon CA

**2003**

APS BioGroup™ Founded in Phoenix AZ



**2004**

APS BioGroup Facility Expansion (30k sq. ft)

**2014**

APS BioGroup Relocation  
Now Largest Colostrum Production Facility (100k sq ft)

**2016**

La Belle and APS BioGroup Join PanTheryx Inc.

**2020**

PanTheryx, World Leader in Colostrum  
Production



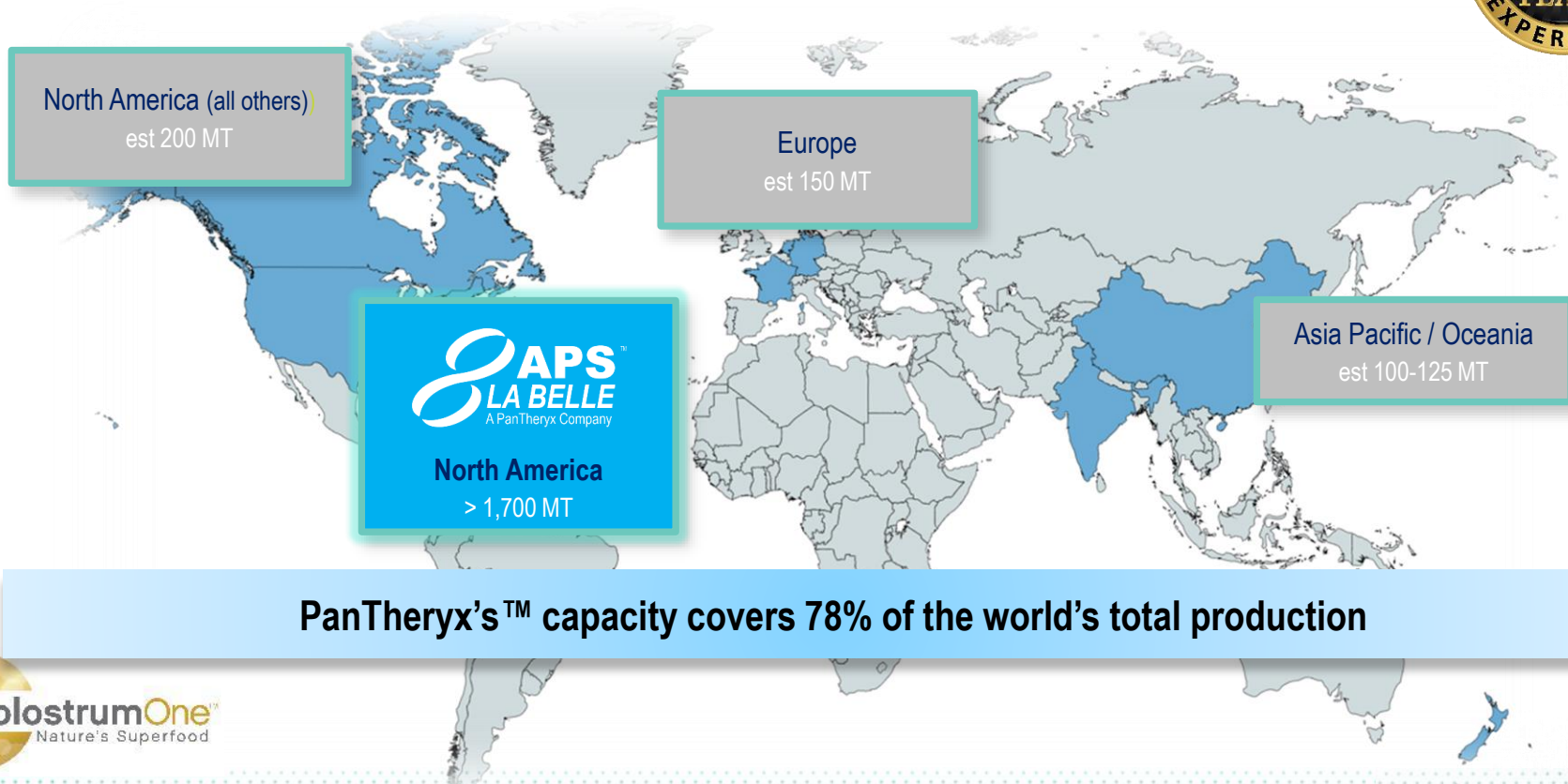
PanTheryx, Inc.

a biotechnology company that  
harnesses the power of  
colostrum to develop nutritional  
therapeutics that improve  
human and animal health  
globally.





# Global Bovine Colostrum Production Capacity- Human



**North America**  
> 1,700 MT

**Asia Pacific / Oceania**  
est 100-125 MT

**PanTheryx's™ capacity covers 78% of the world's total production**





# How PanTheryx™ Can Serve You

## Bulk Colostrum Ingredients

Largest manufacturer of bulk ingredients and finished products

- Dedicated human health division
- Dedicated animal health division

## Contract Manufacturing

Nutritional supplements of exceptional quality

- Private label
- In-house product formulators

## Custom Spray Drying

Broad range of capabilities with exceptional expertise across spectrum of needs

## Research & Development

R&D partnerships to develop and commercialize new innovations





# **Colostrum: An Exciting Frontier in Health and Wellness**



# **Colostrum Jump-Starts Baby's Health**

**Colostrum is produced by the mammary glands of all mammals; essential to the newborn during the first hours of life**



# Dairy Cows: A Potent Source of Colostrum



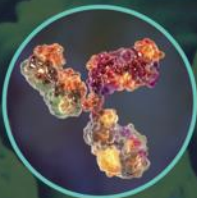
- Like humans, cows (bovine) produce colostrum
- Newborn calves do not passively receive protective antibodies (immunoglobulins) from the mother prior to birth; they get it directly from colostrum in the days following birth to survive and thrive
  - Bovine colostrum remains in the mammary gland (udder) until the calf's birth and is highly potent
- Bovine colostrum collected after birthing is a concentrated source of beneficial biologically active nutrients
- Bovine colostrum is collected only after the calves receive the colostrum needed to flourish



# Most Components in Bovine Colostrum are Functionally Identical to Human Colostrum

Both contain immunoglobulins and approximately 90 functional, beneficial components

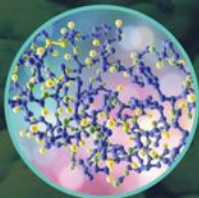
## POLYCLONAL ANTIBODIES



IgG, IgA, IgM, IgD, IgE

Naturally target a range of pathogens.<sup>1</sup>

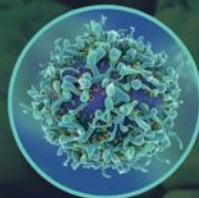
## GROWTH AND REPAIR FACTORS



IGF-I, IGF-II, EGF, TGF- $\alpha$ , TGF- $\beta$

Regulate cell growth, proliferation and differentiation for repair of tissue and mucosal restitution.<sup>2-8</sup>

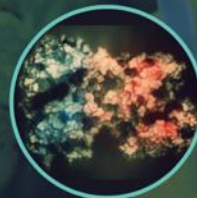
## IMMUNE MODULATORS



IL-1 $\beta$ , IL-6, TNF- $\alpha$ , IFN- $\gamma$ , IL-1ra

Regulators of epithelial cell growth and development, including intestinal inflammation and epithelial restitution following mucosal damage.<sup>9-12</sup>

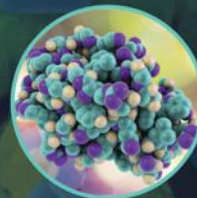
## BROAD SPECTRUM ANTIMICROBIALS



Lactoferrin, lysozyme, lactoperoxidase, defensins

Exhibit antimicrobial and antiviral activity.<sup>13-17</sup>

## OLIGOSACCHARIDES



Neutral, acidic, sialylated

Specific oligosaccharides support the growth of beneficial bacteria and can compete with virulent bacteria and viruses for attachment sites for epithelial cell surface receptors.<sup>18-22</sup>

***Like Human Colostrum,  
Bovine Colostrum:***

- Aids in uptake and metabolism of necessary nutrients
- Supports and maintains a healthy digestive and immune system
- Supports microbiome equilibrium in the gastrointestinal tract



# Bovine Colostrum Has An Extensive History of Safe Use



Colostrum is **grandfathered as an old dietary ingredient** under United Natural Products Association (UNPA)



A 2019 independent scientific expert panel **affirmed the safety of PanTheryx bovine colostrum** as Generally Recognized As Safe (GRAS) for specific food and beverage uses



**6,000+ studies\*** illuminating science of bovine colostrum with new studies exploring safe applications for human and animal health



Caution provided that if allergic to cow's milk or milk products may also be allergic to bovine colostrum and best to avoid it



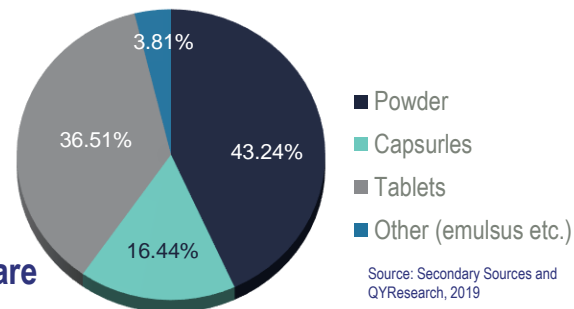
# Attractive Opportunity with Emerging Global Bovine Colostrum Market

**Global Colostrum Retail Market ~\$1.4B in 2018 with CAGR: +4% from 2018-2025**

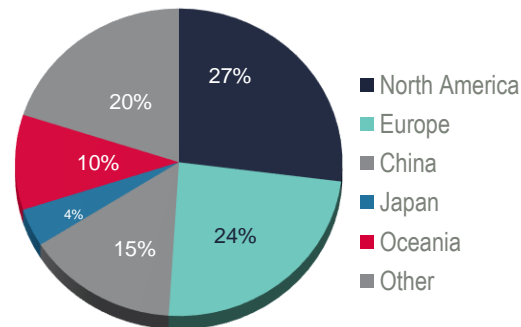
*Awareness of colostrum strong and growing with consumer trends:*

- **Consumerization:** more knowledgeable consumers with greater access to healthcare information
- **Increasing acceptance and interest** in food as medicine
- **Growing group of proactive wellness seekers** (from treatment to prevention)
- **Rising healthcare costs** borne by the consumer
- **Increasing demand for natural alternatives** with safety/tolerability concerns with OTC's and drugs

**Global Bovine Colostrum  
2018 Sales Market Share  
by Applications**



**Bovine Colostrum  
Market by Region  
Based on Sales**





# Clinical Studies Support Multiple Product Applications

*Used in various product categories around the world to promote many aspects of human and animal health*

## Immune Health

ColostrumOne™ balances immune response, beneficial for sustaining good health

## Digestive Health

ColostrumOne™ supports the gut's natural repair process, restoring normal function

## Sports Nutrition

ColostrumOne™ helps increase muscle mass and exercise recovery and endurance

## Skin Health

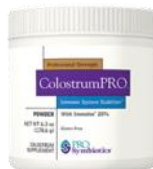
ColostrumOne™ contains growth and immune factors that support healthy skin





# High Quality Colostrum Product Examples

## Immune Health



## Digestive Health



## Sports Nutrition



## Skin Health



ColoBaby is a trademark of VitaDairy, Symbiotics ColostrumPro and Symbiotics Colostrum Plus are trademarks of Prevention LLC, Colostrum6 is a trademark of ImmuneTree Inc, Colostrum-LD is a trademark of Sovereign Laboratories, 4Life Transfer Factor, Renuvo, Pro-TF are trademarks of 4Life, UpSpring is a trademark of UpSpring LLC, ChildLife Essentials is a registered trademark of Dr. Murray Clarke, Colostrum Prime Life is a registered trademark of Jarroo Formulas, BIO GRO is a trademark of ISatori Inc., Overtraining Solution is a trademark of Ambrosia Nutraceuticals, Epicuren is a trademark of Epicuren Discovery

# Our Capabilities





# Global Leader in Colostrum

PanTheryx™ is the global leader in colostrum, controlling every stage of production, from collection through processing in its state-of-the-art vertically integrated facilities.

## Colostrum Collection

Expansive and growing procurement network  
1000+ dairies

Only collect first day colostrum



## State-of-the-Art Processing

Registered FDA and USDA inspected facilities  
21 CFR-111 & 117, cGMP, HACCP, FSSC, Kosher, Halal, Non-GMO

In-house clinical laboratory & accredited third-party validation



## Quality

Stringent quality assurance systems

In-process and finished product tested for safety (micro) and to ensure that it meets specifications



## Product Development

Deep expertise with colostrum formulations

Physical product development & piloting

Research and claims development



## Manufacturing Capabilities

Bulk colostrum, blended powders, tablets, capsules

Packaging in jugs, bottles, and single-serve sachets

Multiple colostrum manufacturing locations for reliable & consistent supply





# Plant Certifications and Memberships

- cGMP (Good manufacturing practices)
- 21CFR117 (Risk-Based Preventative Controls for Human Food)
- 21CFR111 (Dietary Supplements)
- HACCP (Hazard Analysis and Critical Control Procedures)
- FSSC (Food Safety Systems Certification)
- CNCA inspected by USDA for exporting into China
- Halal
- Kosher
- Registered FDA and USDA Inspected Facilities
- In-house laboratory and accredited third-party validation
- Standard Operating Procedures procurement, manufacturing, material handling, testing, finished goods release, line clearance, employee training
- Contract Manufacturing: Site Certified Organic by Oregon Tilth





# PanTheryx™ Competitive Advantage



## Higher Bioactivity

First Day Colostrum Milking  
which has higher bioactivity  
than subsequent days

Proprietary processing that does  
not degrade immune and growth  
factors, and retains bioactivity

## Supply Chain

PanTheryx capacity covers 75%  
of the total worlds production

Global supply and  
distribution network

## Superior Solubility & Dispersibility

through agglomeration  
and/or instantizing  
techniques

## Standardized Product

Protein  
IgG  
Fat

## Stringent Testing

to ensure  
consistency of  
quality, safety, and  
efficacy





# Proprietary Powders



- Use agglomeration and/or instantizing techniques for superior solubility
- Non-GMO, Kosher & Halal
- Non-allergenic instantizing



# Product Forms



	ColostrumOne Whole 45/15	ColostrumOne Skim 60/20	ColostrumOne Ultra Skim 70/30
Protein	45%	60%	70%
IgG	15%	20%	30%
Fat	15-28%	<5%	<5%
Solubility	Moderately Soluble	Highly Soluble	Highly Soluble
Color	← Off White to Cream Color →		
Taste	← Diluted, Non-sweet, Milk →		
Allergen	← Allergen: Milk →		



# Processing Flow



**Raw colostrum collected required to meet quality standards**



**Colostrum manufacturing process**



**Quality testing and assurance**



**Storage, shipping and distribution**





# Processing Flow



Each dairy's frozen colostrum is tracked farm to factory. Quality compliance is confirmed on a regular basis.



Colostrum is pasteurized to remove any harmful pathogens and preserve activity of bioactive components.



Indirect heat applied for efficient spray drying. Latest agglomeration and instantizing techniques utilized for superior solubility.



# Products – Processing Flow

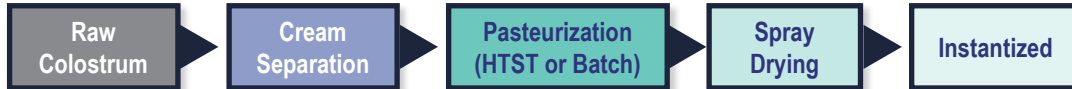


## ColostrumOne Whole 45/15



- 45% Protein, 15% IgG
- Least processed
- Fat content helps protect bioactives from degradation in stomach

## ColostrumOne Skim 60/20



- 60% Protein, 20% IgG
- Highly soluble

## ColostrumOne Ultra Skim 70/30



- 70% Protein, 30% IgG
- Highly soluble
- Highest protein and IgG content



# Quality Standards



Sample and test incoming and outgoing items including colostrum, raw materials, and packaging components to ensure all specifications are met



Each batch of finished product is tested for safety and efficacy



Extensive in-process and final product compositional & micro testing



## **PanTheryx™ contracts quality dairies to purchase and ethically collect excess colostrum**



### **ANIMAL CARE**

Dairies are in compliance with local, state, and federal laws and regulations for animal care and herd health

PanTheryx only collects from first day milkings after the calf receives what it needs.



### **QUALITY**

Each dairy is thoroughly evaluated through formal assessment process of quality guidelines.



### **TRACEABILITY**

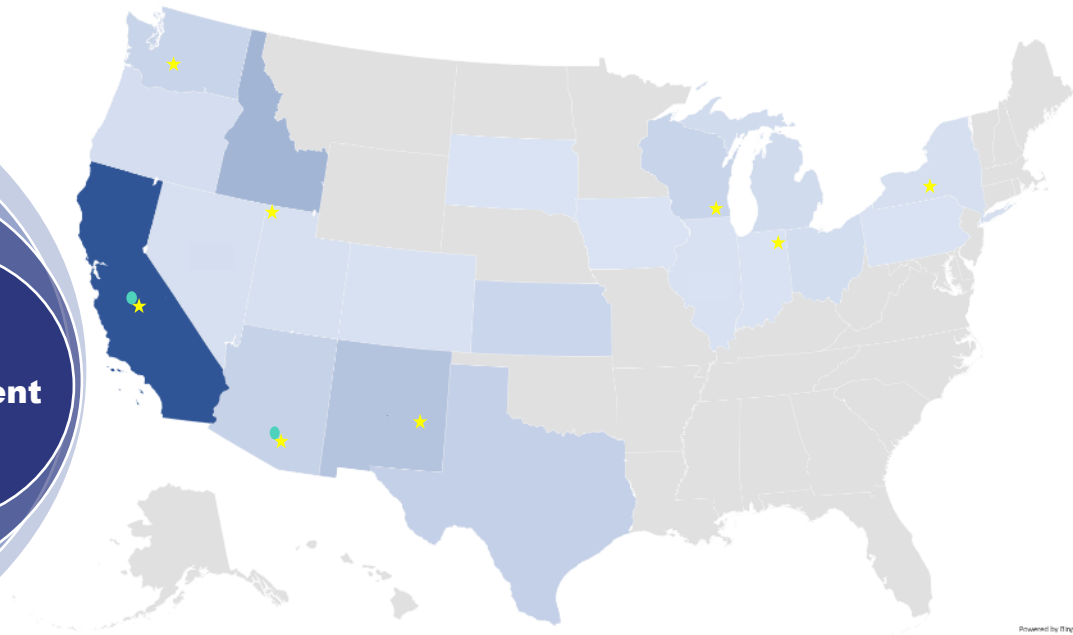
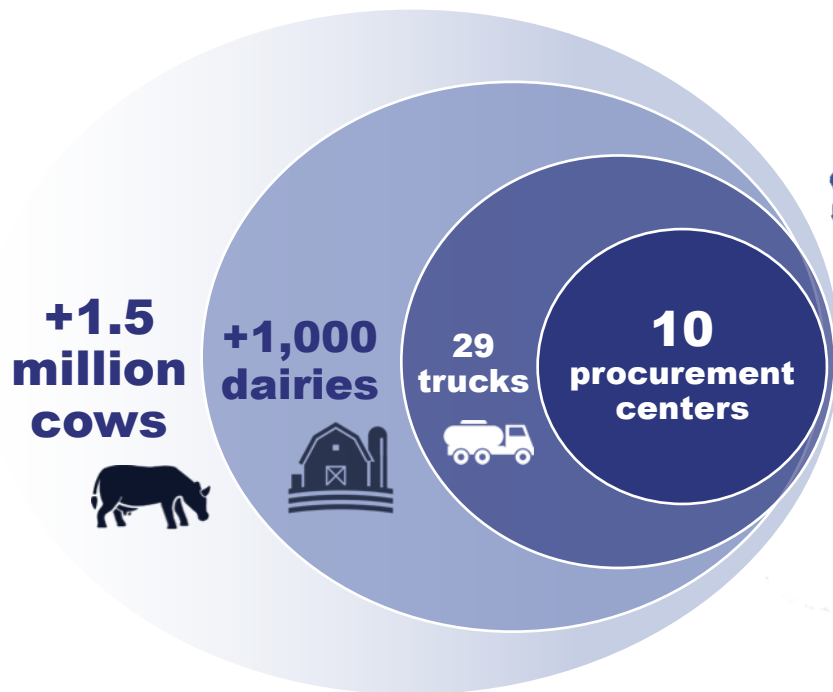
Dairies are assigned unique ID number which is traced throughout the entire manufacturing process



# Collection Infrastructure



## Year-round Collection\*



★ APS LaBelle Procurement Center

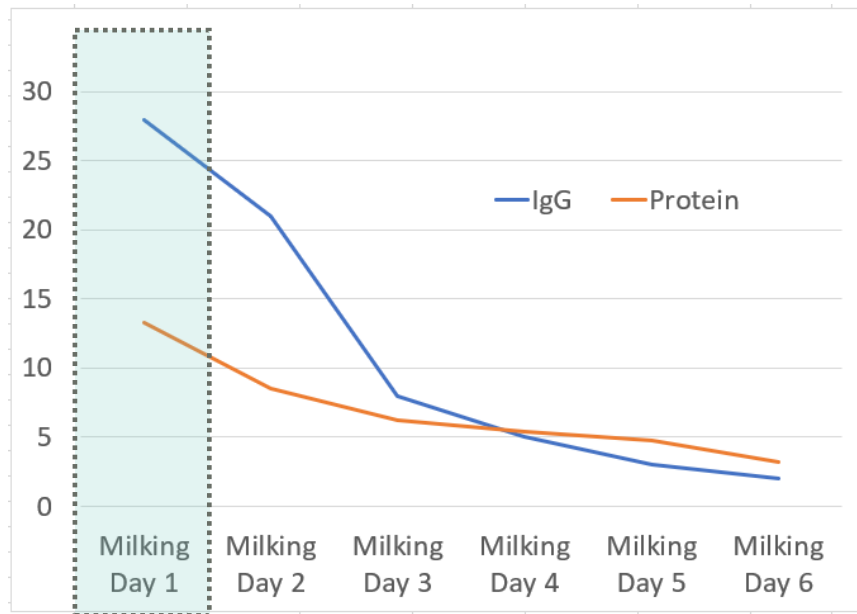
● APS LaBelle Manufacturing Centers

\*As the demand for Bovine Colostrum grows, we will expand our collections to include other countries.



# Colostrum to Milk Transition

**PanTheryx™ only collects from first day milkings after the calf receives what it needs.**





## Scientific Advisors— Colostrum Subject Matter Expertise



**Michael Roizen, M.D.**

Best-selling author and chief wellness officer emeritus, the Cleveland Clinic



**Lauren Crosby, M.D., FAAP**

Nationally recognized parenting expert and pediatrician in private practice in Beverly Hills, CA, and attending physician at Cedars-Sinai Medical Center



**Robin West, M.D.**

Robin West, M.D. chairman of Inova Sports Medicine in Virginia, and head team physician for the Washington Nationals and Washington Football Team



**Harry Oken, M.D.**

Specializes in internal medicine with a private practice in Columbia, Maryland; adjunct professor of medicine at the University Maryland Medical School



# Your Opportunity to Innovate with Nature's Superfood

- The Global Bovine Colostrum Market is an attractive growth platform for health and wellness
- Over 6,000 studies illuminate the science, efficacy and safety of bovine colostrum
- ColostrumOne is a comprehensive solution for application in many areas of health and wellness
- PanTheryx™, the world's premier supplier of bovine colostrum, can provide the quality and consistency you need regardless of the size of your opportunity

Let's Get Started: Select Your Area of Greatest Need



Digestive Health



Immune Health



Sports Nutrition



Skin Health

# PANTHERYX

## Thank You



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