



*Introducing an innovative NEW plant-based protein*



# What is Optein™?

- A water-soluble, lightly hydrolyzed wheat protein versatile enough to add to any application.
- Ideal for:
  - *Nutritional Bars/ Beverages*
  - *Bakery Products*
  - *Vegetarian/Vegan Applications*



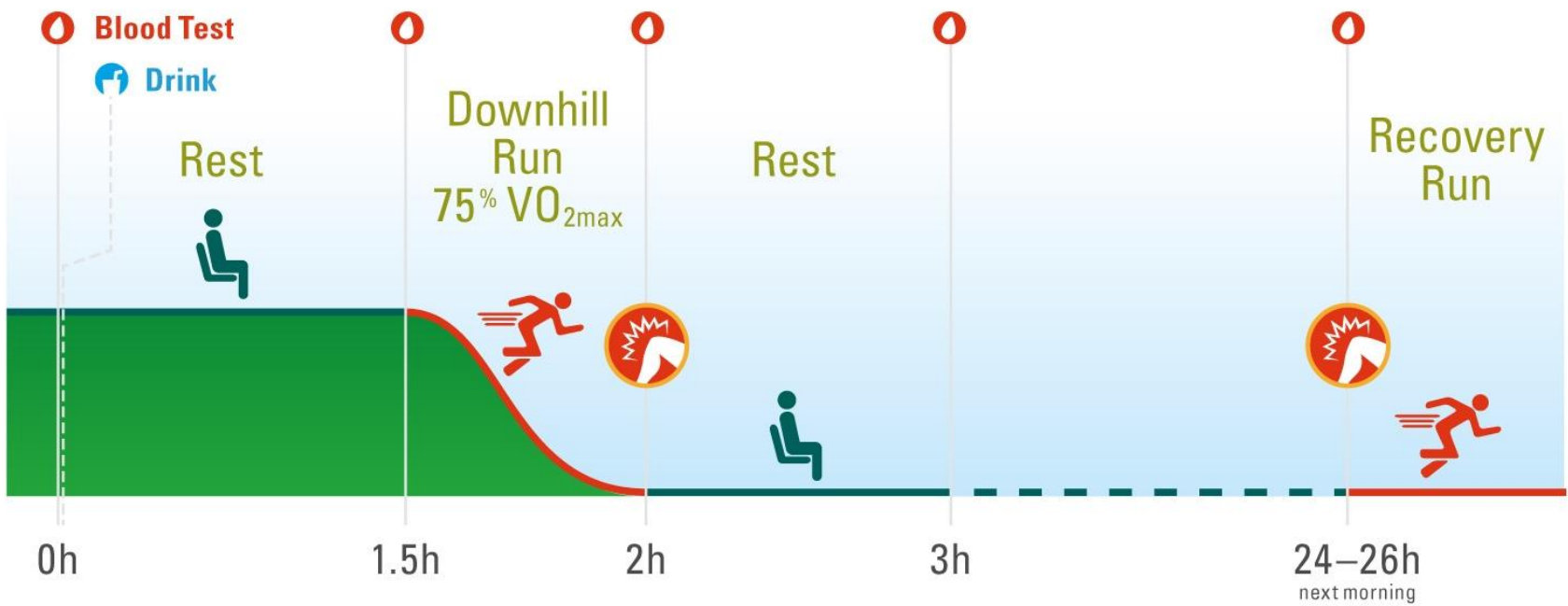
# Features and Benefits

- ✓ Increases protein
- ✓ High glutamine content
- ✓ Easily soluble in water
- ✓ Neutral pH
- ✓ Non-bitter flavor profile
- ✓ Reduces mix time
- ✓ Increases dough extensibility
- ✓ Provides functional benefits in finished products
- ✓ Aids in muscle recovery



# TESTING METHODOLOGY

Muscle soreness, blood glutamine, blood glucose and blood lactate levels in physically fit individuals were tested in a university metabolism laboratory. Optein™ was proven to perform as well as both soy and whey protein alternatives.



# MUSCLE SORENESS

The participants tended to report less muscle soreness the day after exercise with the protein drinks compared with drinking water.

	Delayed Onset Muscle Soreness*	
	<i>Post-Run Soreness</i>	<i>24-hour Soreness</i>
Optein™	2.4 ± 1.0	2.8 ± 1.1
Soy Protein Isolate	2.4 ± 1.0	2.5 ± 1.1
Whey Protein Isolate	2.4 ± 1.0	2.4 ± 1.0
Water	3.1 ± 1.1	3.5 ± 1.0

*Differences between treatments on perceived muscle soreness immediately after running and 24 hours after running*

*\* Trend for protein drinks to minimize delayed onset muscle soreness compared with water, with no difference between type of protein*

# GLUTAMINE LEVELS

Optein™ has approximately double the glutamine content of soy and whey proteins. Ninety minutes after ingestion of the protein drink, Optein™ tended to have a higher blood glutamine level compared to soy and wheat proteins.

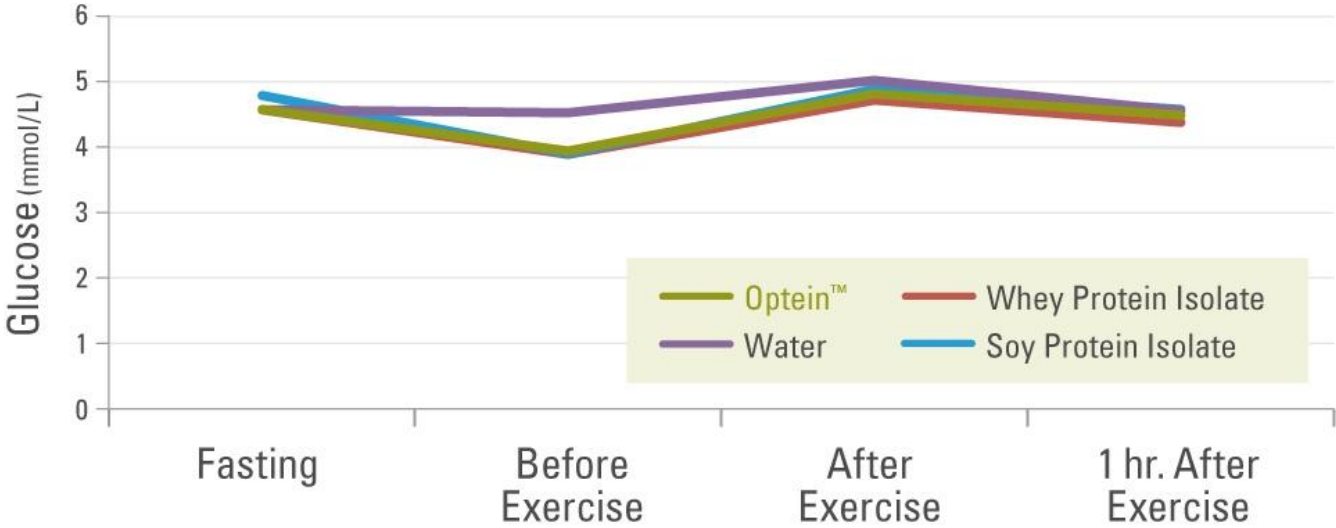
<b>Amino Acid</b>	<b>Optein™</b>	<b>Soy Protein Isolate</b>	<b>Whey Protein Isolate</b>
Glutamine* (g/100g)	27.9	14.2	14.8
Blood Glutamine** (mg/dL)	3.6	2.9	3.0

\* Estimated from glutamic acid data of protein ingredient

\*\* Blood glutamine level 90 minutes after ingestion of protein-containing drink

# BLOOD GLUCOSE AND LACTATE LEVELS

Drinking the protein beverage prior to exercise showed that blood glucose levels remained in the normal and safe range during and after the exercise for the three sources of protein. In addition, the level of blood lactate, an indicator of exercise stress, was not affected by the protein drinks (data not shown).



# EFFECT ON DOUGH FUNCTIONALITY

Optein™ reduces mixing time and increases dough extensibility, which makes it suitable as L-cysteine replacer in bakery product applications.

<b>Sample</b>	<b>Level, %</b>	<b>Mixograph</b>	
		<i>Absorption, %</i>	<i>Peak, min</i>
Control Flour	-	67	4.50
Optein™	0.5	67	4.25
	1.0	67	4.00
	1.5	67	3.50



# Keeping You Informed

- We look forward to keeping you updated about future developments regarding this nutritional ingredient.

