

## LIPOSOMAL FORMULA

# LIPOTONE



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**LipoTone** is a peptide complex designed to support weight management and healthy metabolic signaling. This liposomal blend includes DNF-10<sup>®</sup> (Saccharomyces cerevisiae-derived yeast hydrolysate) and phosphatidylcholine – synergistic ingredients supporting healthy appetite and satiety signaling, metabolic balance, energy intake, and overall body composition.

## EDUCATION

With the growing concerns around excess body weight and its association with poorer metabolic and cardiovascular health outcomes, many people have turned to weight loss management techniques that extend beyond diet and exercise.<sup>1</sup> While considerable focus has been placed on glucagon-like peptide-1 (GLP-1) receptor agonists, they are not always suitable for everyone seeking weight loss management support.<sup>2</sup> As such, other strategies are being explored to support natural weight management physiology.

## WEIGHT MANAGEMENT PHYSIOLOGY

Weight regulation depends on the interplay between appetite signaling, stress responses, metabolic efficiency, and fat digestion.<sup>3</sup> Hunger and fullness cues, driven by peptides like ghrelin, PYY, and CCK, help manage energy intake but can be disrupted by stress or exposure to hyperpalatable foods, leading to increased snacking and reward-driven eating. Metabolic efficiency further depends on healthy mitochondrial function, which influences how effectively the body converts nutrients into energy. Finally, phospholipids, such as phosphatidylcholine, support bile formation and the emulsification of dietary fats, thereby aiding in nutrient absorption and maintaining overall metabolic balance. Together, these systems shape how effectively the body maintains a healthy energy equilibrium.

## DNF-10<sup>®</sup>: PEPTIDE-RICH YEAST HYDROLYSATE

Peptides are a growing area of research and clinical interest, especially for metabolic health.<sup>4</sup> One such peptide, DNF-10<sup>®</sup> (yeast hydrolysate), is a yeast peptide complex, with research reporting an influence on appetite-regulating pathways, hedonic eating behaviors, and markers related to body composition and metabolic balance.<sup>5,6</sup> Created through the enzymatic hydrolysis of *Saccharomyces cerevisiae*, DNF-10<sup>®</sup> contains an ultra-filtered version of the isolated peptides from brewer's yeast.<sup>7</sup>

## APPETITE & SATIETY SIGNALING

Managing appetite, ghrelin secretion, and GLP-1 activity may support healthy weight management efforts. An animal study assessed the effects of yeast hydrolysate (YH) at varying doses on appetite and ghrelin.<sup>8</sup> Results showed that all doses of YH significantly decreased food intake and ghrelin levels. Another animal study demonstrated that YH promoted appetite suppression by modulating the enteroendocrine pathways involved in satiety signaling.<sup>9</sup> While more research is needed, this preclinical evidence points to the modulating effects of peptides on pathways involved in GLP-1 activity in the colon, possibly promoting slower gastric emptying and sustained satiety.<sup>10,11</sup>



## Supplement Facts

Serving Size: 7.5 mL Servings Per Container: 60

	Amount Per Serving	% Daily Value
DNF-10 <sup>®</sup> (from Yeast Hydrolysate) (Saccharomyces cerevisiae)	250 mg	**
Phosphatidylcholine (from highly purified phospholipids)	300 mg	**

\*\*Daily Value not established

**Other Ingredients:** Glycerin, water, ethanol, acacia gum, natural flavoring, natural citrus oils

## **REWARD-DRIVEN EATING & HEALTHY BODY COMPOSITION**

YH has been studied for its potential influence on reward-driven eating and markers related to body composition. In an 8-week study of obese women taking a low daily dose (0.5 g), participants experienced significant reductions in body weight, body mass index (BMI), body fat, and overall caloric intake, along with reports of lower appetite and decreased preference for sweets—suggesting a shift away from reward-driven or stress-linked eating patterns.<sup>6</sup> Additional clinical research supports these outcomes: across trials in overweight and obese adults, YH supplementation reduced body weight and BMI and was associated with decreased abdominal fat accumulation while helping maintain lean mass.<sup>5,6</sup>

Preclinical studies complement these findings and help clarify potential mechanisms. In a 5-week mouse study, YH supplementation reduced epididymal fat levels, triglycerides, LDL cholesterol, hepatic G6PD activity, and overall weight gain, even when animals consumed a high-fat diet.<sup>12</sup> Notably, serum ghrelin increased in a dose-dependent manner while fat storage decreased, suggesting effects on fatty acid synthesis and metabolic signaling. An earlier rat study found similar reductions in weight gain and lipogenesis, potentially linked to altered expression of neuropeptide Y and tryptophan hydroxylase.<sup>13</sup> A separate animal study also reported that combining YH with exercise produced greater benefits on body weight, adipose tissue, fatty acid oxidation, and inflammatory markers than either intervention alone.<sup>14</sup> Together, this human and animal data suggests YH may influence appetite-related pathways and metabolic processes involved in healthy body composition.

## **PHOSPHATIDYLCHOLINE**

Phosphatidylcholine (PC) is a key membrane phospholipid involved in cell structure, bile composition, lipid transport, and mitochondrial function.<sup>15</sup> Through these roles, PC contributes to fat digestion, hepatic lipid handling, and nutrient movement across membranes, making it a foundational component of metabolic-support formulations.

## **FAT EMULSIFICATION, BILE FLOW, & DETOXIFICATION PATHWAYS**

PC is the predominant phospholipid in bile and has been shown in animal models to help protect the gastrointestinal lining from bile salt-related irritation.<sup>16,17</sup> Bile is required for the emulsification and digestion of dietary fats and cholesterol, and it plays a role in the elimination of byproducts generated during normal metabolism.<sup>18</sup> By supporting healthy bile composition, PC may contribute to digestive comfort and efficient nutrient absorption, particularly with higher-fat meals.<sup>18,19</sup>

In mouse models of high-fat feeding, PC supplementation was associated with favorable changes in liver lipid markers, reduced weight gain, and a more balanced bile acid profile.<sup>20</sup> Elevated free bile acids are linked to metabolic disruption and liver stress in animal studies, and PC appeared to shift the microbiome toward species involved in bile acid metabolism and short-chain fatty acid production. These findings highlight potential mechanisms through which PC may influence metabolic pathways.

## **CELLULAR & MITOCHONDRIAL ENERGY EFFICIENCY**

Phospholipids are important components of cellular and mitochondrial membranes, and PC comprises approximately 30–40% of mitochondrial phospholipids.<sup>21</sup> As a major contributor to polyunsaturated fatty acids content, PC contributes to membrane fluidity, signaling, and the function of proteins involved in transport and metabolic processes. Adequate PC helps maintain the structure of mitochondrial membranes, including the curvature and stability of the inner membrane, which is necessary for normal electron transport and nutrient movement. By supporting healthy membrane dynamics and facilitating the transport of fatty acids and other substrates into mitochondria, PC plays a role in sustaining mitochondrial efficiency and may contribute to metabolic flexibility, or the ability to utilize different fuel sources as needed.<sup>22</sup> Overall, these structural roles suggest that maintaining adequate phosphatidylcholine levels may help support balanced cellular energy metabolism.

**Quicksilver Delivery Systems**<sup>®</sup> improve upon liposomal and emulsification technology with smaller, more stable particles made from the highest-grade ingredients available. In addition to exceptional absorption rates, these tiny liposomal and nanoemulsified particles increase diffusion across mucus membranes, enhance lymphatic circulation of nutrients and support cellular delivery.