Digestive Enzymes SAP

Science-based enzyme complex for optimal digestive health

Digestive Enzymes SAP is a combination of ox bile, betaine hydrochloride, and pancreatic enzymes. It has been documented that, as we age or are under chronic stress, the production of important digestive enzymes can drop significantly. This can result in symptoms such as abdominal bloating, gas, or a feeling that food isn't passing through the digestive system effectively, known as functional dyspepsia. **Digestive Enzymes SAP** may also be helpful for patients with exocrine pancreatic insufficiency or food intolerances, and after gallbladder removal. This formulation contains enzymes that help with the breakdown of proteins, fats, and carbohydrates, and is useful for patients with suboptimal digestive enzyme production.

ACTIVE INGREDIENTS

Each non-GMO vegetable capsule contains:

Betaine hydrochloride	400 mg
Ox bile extract (10:1)	100 mg
Pancreatic enzymes	81 mg
(Protease 8100 USP, Amylase 8100 USP, Lipase 648 USP)	
Pepsin (500,000 FCC Pepsin)	50 mg
Bromelain (1,620,000 FCC PU)	45 mg
Papain (2,400,000 FCC PU)	24 mg

Note: All enzymatic units are per capsule.

This product is non-GMO.

Contains no: Gluten, soy, wheat, eggs, dairy, yeast, citrus, or artificial flavour or colour.

Digestive Enzymes SAP contains 90 capsules per bottle.

DIRECTIONS FOR USE

Adults: Take 1 capsule up to three times daily before a meal or as directed by your healthcare practitioner. Use the smallest effective dose which controls symptoms. Consult a healthcare practitioner for prolonged use.

INDICATIONS

Digestive Enzymes SAP may help:

- In reducing feelings of abdominal bloating and gas.
- In augmenting your body's ability to digest carbohydrates, proteins, and fats.
- Alleviate symptoms of constipation due to poor enzyme production.
- Reduce symptoms associated with exocrine pancreatic insufficiency.
- Reduce digestive concerns post–gallbladder removal.
- Reduce symptoms of functional dyspepsia.
- Improve fat absorption in patients with short bowel syndrome.

CAUTIONS AND WARNINGS

Consult a healthcare practitioner if symptoms persist or worsen. Consult a healthcare practitioner prior to use if you are pregnant or breast-feeding; if you have a gastrointestinal lesion/ulcer; if you are taking anticoagulants / blood thinners, anti-inflammatories, or antibiotics; if you are having surgery; if you have an allergy to latex or fruits (such as avocado, banana, chestnut, passion fruit, fig, melon, mango, kiwi, pineapple, peach, or tomato); if you have diabetes, pancreatitis, pancreatic exocrine insufficiency, cystic fibrosis, peptic ulcer, excess stomach acid, or high cholesterol.

Contraindications: Do not use this product if you are sensitive to pancreatic enzymes or to pork proteins.

Known adverse reactions: Hypersensitivity/allergy has been known to occur; in which case, discontinue use. Nausea, vomiting, abdominal pain/epigastric pain and/or heartburn have been known to occur with digestive enzymes; in which case, discontinue use and consult a healthcare practitioner.

PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for all **Digestive Enzymes SAP** lot numbers have been tested by a third-party laboratory for identity, potency, and purity.

Scientific Advisory Panel (SAP): adding nutraceutical research to achieve optimum health

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351, Rue Joseph-Carrier, Vaudreuil-Dorion, Quebec, J7V 5V5
T 1 866 510 3123 • F 1 866 510 3130 • nfh.ca

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OX BILE

Bile is produced in the liver, then stored and concentrated in the gallbladder until it is secreted into the small intestine to help emulsify fats. Patients who have had their gallbladder removed secrete bile directly from the liver into the small intestine; however, the bile is not as concentrated with this mechanism. The delivery of bile can also be impaired by stones or sludge that can build up in the gallbladder. Ox bile, as the name implies, is bile that is sourced from oxen and resembles human bile. When it is consumed with foods containing fats, it will help to emulsify the fats so that the enzyme lipase is then properly able to digest the fat particles. Researchers set out to determine if oral forms of bile would be helpful for digestion and used either ox bile, human bile, or bile salts in patients with complete biliary fistula and noted cholagogic action.[1] There were significant improvements in appetite and bowel movements, without the need for extra medications. In addition, stools decreased in bulk, but improved in consistency and colour.[1] The authors recommended using a bile supplement in patients where a cholagogue would be indicated, as well as with certain cases of constipation or when a patient needs support in digesting fat or fat-soluble vitamins.[1]

Ox bile can also be an effective supplement for patients with short-bowel syndrome. A study investigated the effect of natural conjugated bile acid sourced from ox bile on fat absorption and diarrhea in patients with short bowel syndrome.[2] Researchers found that, with bile replacement therapy, there was an increase in fat absorption of approximately 40 g/day, and that calcium absorption also improved, without any reported side effects.[2] Researchers concluded that conjugated bile acid replacement therapy should be part of the treatment for selected patients with short-bowel syndrome.[2]

PANCREATIC ENZYMES: LIPASE, AMYLASE, PROTEASE

Functional dyspepsia, described by most as a feeling of fullness or discomfort with eating, is a common concern that brings patients to seek medical advice. Consumption of a high-fat meal is associated with the release of enteric hormones and dysrhythmia of stomach emptying (tachygastria), which may contribute to delayed gastric emptying.[3] Supplementation with lipase may help reduce the symptoms of postprandial functional dyspepsia.[3]

Pancreatic enzyme supplementation is the therapy of choice for the management of exocrine pancreatic insufficiency (EPI).[4] Symptoms of EPI include abdominal pain, steatorrhea, maldigestion, and weight loss due to poor nutrient absorption.[4] The most common cause of EPI is chronic pancreatitis, which impairs the production of pancreatic enzymes.[4] EPI can also be common in both type 1 and type 2 diabetes, as well as in patients with cystic fibrosis.[4] Porcine lipase is the treatment of choice for pancreatic exocrine insufficiency.[4]

BETAINE HYDROCHLORIDE

Researchers investigated what effect supplementation with betaine would have in rats fed a high-fat diet. Endpoint measures included regulation of one-carbon metabolism as well as liver lipid accumulation induced by a high-fat diet in rats.[5] Rats were supplemented with one of three diets: a liquid diet (35% fat) (control), a high-fat diet (71% fat), or a high-fat diet plus betaine (1% g/L).[5] After three weeks, rats in the high-fat-diet group had increased total liver fat concentration, liver triglycerides, liver TBARS, and plasma TNF-α.[5] The high-fat diet also decreased adenosylmethionine concentration, the *S*-adenosylmethionine concentration, and the *S*-adenosylmethionine/*S*-adenosylhomocysteine ratio compared to the control, and it altered the expression of genes involved in one-carbon metabolism.[5] The group receiving betaine had a substantially increased hepatic *S*-adenosylmethionine concentration (about fourfold) and exhibited a reduction in fatty liver or hepatic injury.[5] Moreover, in the betaine-supplemented group, there was a normalization of the gene expression of BHMT, GNMT, and mgAT, which code for important enzymes of one-carbon metabolism related to liver fat accumulation.[5] Authors concluded that the regulation of the gene expression of mgAT by betaine supplementation provides a novel mechanism by which betaine supplementation regulates lipid metabolism and prevents accumulation of fat in the liver.[5]

BROMELAIN

Bromelain is a family of sulfhydryl-containing proteolytic enzymes sourced from the fruit and stem of pineapple.[4] Bromelain can provide proteolytic activity in the stomach as well as the small intestine, as it can work across a pH range of 4.5–9.84. Because of this, bromelain can be used as a supplement in cases of pepsin and/or trypsin deficiency.[4] There have been examples of bromelain being used in combination with pancreatic enzymes to assist digestion in cases of exocrine pancreatic insufficiency.[4] In a study with patients with pancreatic steatorrhoea, supplementing a formula consisting of ox bile, pancreatin, and bromelain resulted in a decrease in stool fat excretion and a resultant weight gain in some patients, as well as an improvement in symptoms such as pain, excess flatulence, and diarrhea.[4]

PAPAIN

Papain is sourced from the papaya fruit and purified from the dried latex.[4] It is a complex of multiple enzymes that have amylolytic, proteolytic, and minor lipolytic activity.[4] Papain is used mainly to aid in protein digestion.[3] Proteolytic enzymes such as papain may also be effective in cases of gluten intolerance and aid patients with celiac disease.[3] In a case study of a patient with celiac disease, once the patient was placed on a gluten-free diet, general digestive symptoms improved and the patient was able to gain weight; however, he did continue to experience persistent steatorrhea.[4] The patient then took 1,800 mg of papain enzyme tablets with each meal, and after one month, no longer experienced loose stools.[4]

REFERENCES

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