

MD DHHC

Jay Cullinan
Divisional Manager
10/25/22



Agenda:

- ENFit compatible: PSTF20/Banatrol TF
- Gelatein MCT
- Expedite



What is ENFit?

- ENFit is a global change to make all enteral (tube feeding) devices specific to tube feeding.
- Every extension set, syringe, long tube/PEG, and NG-tube will be designed with a specific ENFit end so that you can only use products designed for enteral/tube feeding access.



- Example of an ENFit extension set with locking ports



Medtrition
PROSource
Single Dose Liquid Medical Protein **TF20**
20 grams of protein
80 calories
A Medical Food
• Ready-to-Administer
• Water Thin Viscosity
• Formulated for GI tolerance
ENFit[®] Compatible
Net Contents 2 fl oz (60 mL)
Item 11446

Medtrition
Banatrol
Single Dose Liquid Medical Fiber **TF**
5 grams of soluble fiber
43 calories
A Medical Food
• Ready-to-Administer
• Low Viscosity
• Improves Stool Consistency
• Reduces Bloating/Constipation
• Appropriate for C. diff Antibiotics
ENFit[®] Compatible
Net Contents 2 fl oz (60 mL)
Item 10541

ADMINISTER
MODULAR
NUTRITION
AT THE SPEED
OF NURSE.

More than nutrition,
Medtrition[®]

ADMINISTRATION IS AS EASY AS 1,2,3.

ENFit® is a global change to make all tube-feeding devices specific to tube feeding. ProSource TF20 and Banatrol TF are ENFit®-enabled to make administering easy whether your facility is ENFit®-enabled or not.



For traditional legacy tubes, nurses need only



How to Administer

For ENFit compatible tubing, simply connect the modular directly to enteral device, keeping the bag upright to not spill product. Once connected, invert bag and squeeze until bag is empty then disconnect.

For legacy tubing, dispense into a cup. Using an enteral syringe, draw up product and administer into feeding tube slowly.

Remember to flush with 30mL water before and after administration.

MORE THAN NUTRITION

Medtrition develops groundbreaking medical foods used in nursing homes and hospitals across the U.S. and in over 30 countries. Our science and products enable dietitians, nurses and facilities to stay on the leading edge of healing through nutrition.

To learn more, contact your sales representative.

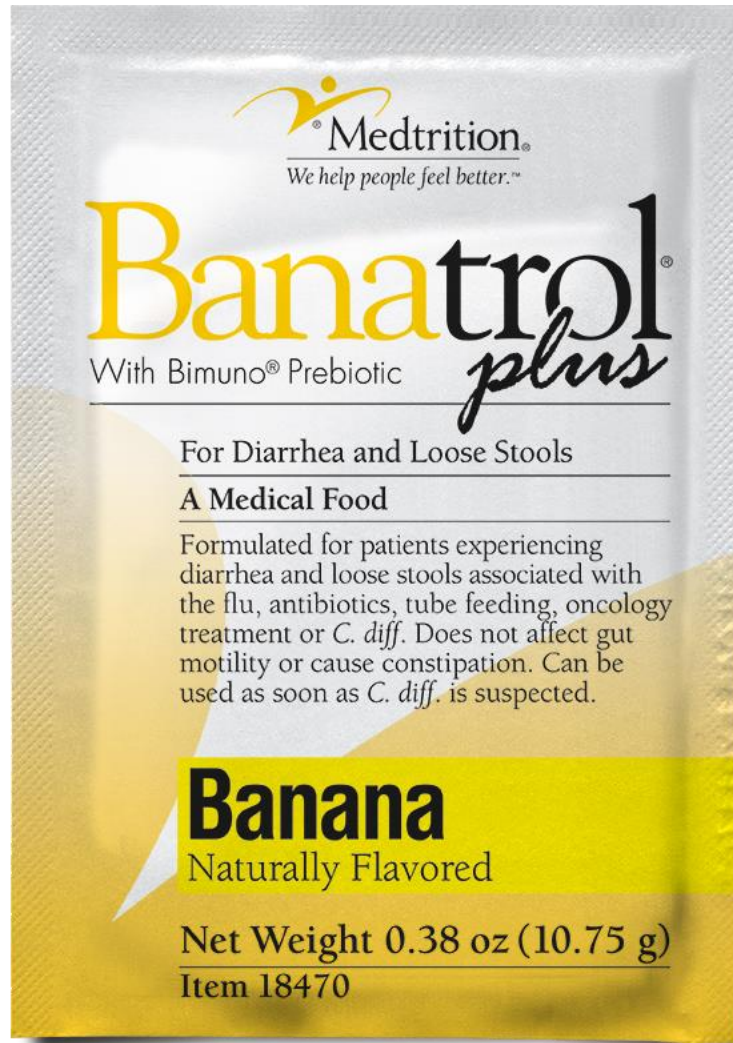
Visit Medtrition.com/TF20 or Medtrition.com/BanatrolTF

Or call 877-271-3570 for product or company details.

ENFit® is a registered trademark of GEDSA



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Banatrol[®] Plus:

- Comprised of a blend of two key ingredients: Banana Flakes, Bimuno GOS (galactooligosaccharides)
- 2 grams of fiber per serving
- Designed to provide an effective natural solution for diarrhea and loose stools while also helping to improve and maintain gut health and integrity.
- Administration?????



Banatrol TF

- Liquid Modular Fiber
- 60mL pouch
- 5 grams of fermentable soluble fiber per pouch
- ENFit Compatible
- Aligns with ASPEN Critical Care Guidelines for diarrhea intervention
- [Banatrol TF](#)

Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.)

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Keywords

nutrition; critical care; intensive care unit; enteral; parenteral; evidence-based medicine; Grading of Recommendations, Assessment, Development, and Evaluation criteria; guidelines

Preliminary Remarks (Intent of Guidelines)

A.S.P.E.N. and SCCM are both nonprofit organizations composed of multidisciplinary healthcare professionals. The mission of A.S.P.E.N. is to improve patient care by advancing the science and practice of clinical nutrition and metabolism. The mission of SCCM is to secure the highest-quality care for all critically ill and injured patients.

Periodic Guideline Review and Update

This particular report is an update and expansion of guidelines published by A.S.P.E.N. and SCCM in 2009.¹ Governing bodies of both A.S.P.E.N. and SCCM have mandated that these guidelines be updated every 3–5 years. The database of randomized controlled trials (RCTs) that served as the platform for the analysis of the literature was assembled in a joint “harmonization process” with the Canadian Clinical Guidelines group. Once completed, each group operated separately in its interpretation

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F1. Based on expert consensus, we suggest that a fermentable soluble fiber additive (eg, fructo-oligosaccharides [FOSs], inulin) be considered for routine use in all hemodynamically stable MICU/SICU patients placed on a standard enteral formulation. We suggest that 10–20 g of a fermentable soluble fiber supplement be given in divided doses over 24 hours as adjunctive therapy if there is evidence of diarrhea.

Banatrol® TF:

- Comprised of a blend of four key ingredients: Banana Flakes, Fibersol-2 (soluble vegetable fiber), Bimuno GOS (galactooligosaccharides) and Apple Pectin
- Provides 5 g of soluble dietary fiber per 60 mL serving
- Designed to provide an effective natural solution for diarrhea and loose stools while also helping to improve and maintain gut health and integrity
- Aligns with current recommendations from ASPEN critical care guidelines for diarrhea intervention in the ICU



Banana Flakes

- Primary ingredient in Banatrol® TF
 - Banana flakes have been shown to be an effective tool to manage diarrhea.
 - Potential bioactive ingredients in bananas include the dietary fibers PECTIN and RESISTANT STARCH.
 - Pectin has been shown to reduce diarrhea in tube fed patients.

J. Fries, et al. *The Journal of Pediatrics*. 1950. 37:367-372; E. Emery, et al. *Nutrition in Clinical Practice*. 1997. 12:72-75; G. Rabbani, et al. *Digestive Diseases and Sciences*. 2004. 49:475-484; D. Zimmaro, et al. *Journal of Parenteral and Enteral Nutrition*. 1989. 13:117-123; P. Raghupathy, et al. *Journal of Pediatric Gastroenterology and Nutrition*. 2006. 42:362-368.

Make The Connection

Bimuno- GOS

- A novel galactooligosaccharide
- fermentable prebiotic that **selectively** stimulates the growth of **beneficial organisms such as *Bifidobacteria***
- Reduces the duration of diarrhea in subjects with traveler's diarrhea

G. Tzortzis, et al. Applied Microbial and Cell Physiology. 2005. 68:412-416; D. Newburg, et al. Journal of Nutrition. 2016. 146:358-367; R. Grimaldi, et al. British Journal of Nutrition. 2016. 116:480-486; A. Drakoularakou, et al. European Journal of Clinical Nutrition. 2010. 64:146-152; J. Vulevic, et al. American Journal of Clinical Nutrition. 2008. 88:1438-1446; J. Vulevic, et al. British Journal of Nutrition. 2015. 114:586-595.

Fibersol-2

- A resistant maltodextrin produced from starch and referred to as soluble vegetable fiber
 - Slowly fermented and extremely well tolerated.
 - Ideally suited for use in tube feeding applications due to its low viscosity.
 - Leads to a shift in the molar proportion of SCFAs to butyrate.

E.A. Flickinger, et al. *Journal of Nutrition*. 2000. 130:1267-1273; A.M Pylkas, et al. *Journal of Medicinal Food*. 2005. 8(1):113-116; N.D. Fastinger, et al. 2008. *Journal of the American College of Nutrition*. 27(2):356-366

Apple Pectin

- A soluble fiber
 - Pectin is extensively fermented by colonic bacteria.
 - Thickens when exposed to certain elements like heat and calcium.
 - Pectin has been shown to reduce diarrhea in tube fed patients.

E. Titgemeyer, et al. American Journal of Clinical Nutrition. 1991. 53:1418-1424; G. Rabbani, et al. Digestive Diseases and Sciences. 2004. 49:475-484; D. Zimmaro, et al. Journal of Parenteral and Enteral Nutrition. 1989. 13:117-123;

Banatrol® TF Fiber Blend®

Ingredients

- Banana Flakes
- Fibersol-2
- Bimuno-GOS
- Apple Pectin

Monosaccharides (Examples)

- Arabinose
- Rhamnose
- Galactose
- Glucose
- Xylose
- Mannose
- Galacturonic acid
- Glucuronic acid

Structures (Examples)

- Homogalacturonans
- Rhamnogalacturonans
- Arabinoxylans
- Xylans
- Mannans
- Glucomannans
- Glucuronoxylans
- Glucans
- Galactooligosaccharides

Rationale: Soluble fiber has influential effects on nutrient absorption, sterol metabolism, carbohydrate and fat metabolism, gut motility, and stool characteristics. Prebiotic fibers also have an impact on the gut microbiota and the gut barrier function. FOSs are indigestible carbohydrates fermented in the colon into short-chain fatty acids (SCFAs). SCFAs (especially butyrate) provide nutrition for the colonocyte, increase colonic blood flow, and stimulate pancreatic secretions.^{189–191} Prebiotics (eg, FOS, inulin) stimulate the growth of *Bifidobacteria* and *Lactobacillus*, often referred to as the “healthy” bacteria. In an observational study of 63 ICU patients with systemic inflammatory response syndrome (SIRS), a stool analysis showed that those with feeding intolerance (14 patients) had significantly lower amounts of anaerobes, including *Bifidobacteria*, and higher amounts of *Staphylococcus* than those patients without feeding intolerance (49 patients; $P \leq .05$). Patients with feeding intolerance were shown to have a higher rate of bacteremia (86% vs 18%; $P < .05$) and greater mortality (64% vs 20%; $P < .05$).¹⁹² Thus, the routine use of a soluble fiber additive should be considered in all ICU patients as a prophylactic measure to help maintain commensal microbiota and promote bowel health. An appropriate dose would be 10–20 g/d divided over 24 hours.¹⁹³



ProSource TF20

- Single Dose Liquid Modular Protein
- 20 grams of protein per 60mL pouch
- ENFit compatible
- Helps more easily meet ASPEN critical care guidelines for protein needs
- [PSTF 20](#)

Question: Which formula should be used when initiating EN in the critically ill patient?

E1. Based on expert consensus, we suggest using a standard polymeric formula when initiating EN in the ICU setting. We suggest avoiding the routine use of all specialty formulas in critically ill patients in a MICU and disease-specific formulas in the SICU.

Rationale: For the majority of patients in an ICU setting, a standard polymeric isotonic or near isotonic 1- to 1.5-kcal/mL formula is appropriate and will be well tolerated. This recommendation is one of exclusion in that no clear benefit to patient outcome has been shown in the literature for the routine use of specialty formulas in a general ICU setting, including those that are designed to be disease specific (diabetes), organ specific (pulmonary, renal, hepatic), semielemental, elemental, or immune modulating. One exception would be the use of an immune-modulating formula in the postoperative patient in a SICU setting (see section O3). Use of immune-modulating formulas has shown no outcome benefits over standard EN formulas in a MICU setting (see section E2). The rationale for pulmonary formulas (high fat to carbohydrate to reduce respiratory quotient) has been shown to be erroneous (effect seen only with overfeeding), and their high content of omega-6 fatty acid may drive inflammatory processes.¹⁵⁸ Disease-specific and severe fluid-restricted formulas may be rarely used in a small percentage of patients on a case-by-case basis due more to physiologic benefits, such as electrolyte profile and volume restriction (renal).



Expedite

2 oz, low volume nutritional wound product

The low volume, and electrolytes in the product make it a perfect fit for your population.

A blend of collagen dipeptides and L- Citrulline

- Expedite is a ready to drink, 2 oz wound healing product that will revolutionize the way you nutritionally manage wounds and pressure injuries.
- A blend of highly concentrated collagen dipeptides and L- Citrulline, Expedite's dual action formula helps stimulate collagen synthesis while driving nitric oxide production allowing oxygen and nutrients to get directly to the wound site for enhanced healing.

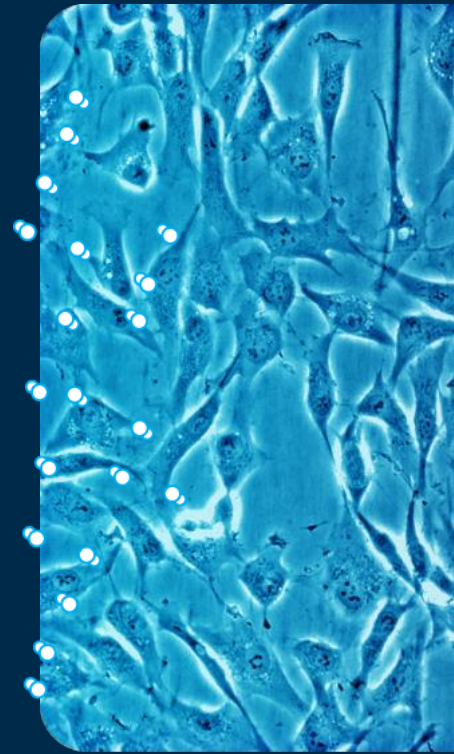
Expedite increases the production of collagen at the wound site

PO & OG are readily absorbed



ABSORPTION THROUGH THE WALL OF THE SMALL INTESTINE

PO & OG reach the wound site and **stimulate the receptors in dermal fibroblasts** (skin cells) to **proliferate and grow.**



FIBROBLASTS

Dipeptides and L-citrulline Super Charge Healing at the Wound Site

- **Delivers 30 times more bioactive collagen dipeptides**, Prolyl-Hydroxyproline (PO) and Hydroxyprolyl Glycine (OG), than regular collagen.
- **Per gram, L-citrulline**, an amino acid, **delivers 40% more** nitric oxide than L-arginine.



REGULAR COLLAGEN PROTEIN

“These results suggest that although all CH are derived from similar raw materials, it might be possible to control the healing effects of CH on pressure ulcers by altering their dipeptide content...”

www.nature.com/scientificreports

SCIENTIFIC REPORTS

OPEN

Ingestion of bioactive collagen hydrolysates enhanced pressure ulcer healing in a randomized double-blind placebo-controlled clinical study

Fumihito Sugihara¹, Naoki Inoue² & Sriiram Venkateswarathirukumara²

We conducted a double blind, multi-centric, placebo-controlled, randomized trial to compare the Pressure Ulcer Scale for Healing (PUSH) and Pressure Sore Status Tool (PSST) scores and wound area measurements at 16 weeks of subjects with pressure ulcers who were given standard care plus one of two types of collagen hydrolysate (CH-a), which contained low levels of prolylhydroxyproline (Pro) and hydroxyprolylglycine (Hyp-Gly), and CH-b, which contained high levels of Pro-Hyp and Hyp-Gly with the placebo group. A total of 120 subjects with stage II or III pressure ulcers were entered into trial and 112 subjects completed the study. The subjects were randomized to receive CH-a (n = 39), CH-b (n = 39), or a placebo (n = 42) twice daily (1.0 g per day) for 16 weeks. The PUSH score, PSST score and wound area of the CH-b group were significantly lower than the placebo group at week 16 (PUSH score, P < 0.001; PSST score, P < 0.01; wound area, P < 0.05). The PUSH score of the CH-a group was significantly lower than the placebo group at week 16 (P < 0.05). This study demonstrated that CH ingestion helps healing of pressure ulcers as an add-on to the standard therapy.

“These findings suggest that the PO and OG absorbed into the blood after the ingestion of CH act on **fibroblasts** in the dermal layers of pressure ulcers and also might affect stem cells, resulting in re-epithelialization and improved healing”.

Sugihara F, Inoue N & Venkateswarathirukumara S. Ingestion of bioactive collagen hydrolysates enhanced pressure ulcer healing in a randomized double-blind placebo-controlled clinical study. *Sci Rep* 8, 11403 (2018).
<https://doi.org/10.1038/s41598-018-29831-7>

L-Citrulline is a more powerful stimulator of nitric oxide than L-arginine



- L-citrulline, an amino acid, is absorbed easily and passes through the liver unchanged.
- Unlike ingested **L-arginine** where **40% is filtered and removed**.
- L-citrulline is converted to **bioavailable arginine** in the kidneys
- Arginine **stimulates the production of nitric oxide** bringing blood flow to the wound site

Benefits of L Citrulline

- Arginine is an amino acid that has evidence to support its role in the wound healing process.
- Arginine stimulates nitric oxide production which aids in vasodilation
- Citrulline may be a more efficient way to improve plasma arginine availability
 - Plasma arginine drives NO production
- Higher doses of Arginine may contribute to GI distress

Supplemental Citrulline Is More Efficient Than Arginine in Increasing Systemic Arginine Availability in Mice¹⁻³

Umang Agarwal,⁴ Inka C Didelija,⁴ Yang Yuan,⁴ Xiaoying Wang,⁴ and Juan C Marin

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OPEN ACCESS Freely available online



Citrulline a More Suitable Substrate than Arginine to Restore NO Production and the Microcirculation during Endotoxemia

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L-Citrulline Supplementation Increases Plasma Nitric Oxide Levels and Reduces Arginase Activity in Patients With Type 2 Diabetes

Alia Shatanawi
Munir N. Ghar

Biochemical and Biophysical Research Communications 454 (2014) 53–57



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Oral supplementation with a combination of L-citrulline and L-arginine rapidly increases plasma L-arginine concentration and enhances NO bioavailability



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Item 11715

Gelatein MCT is specifically formulated to provide additional energy and protein that is easy to consume and digest.

Gelatein MCT is a great tasting, ready-to-serve energy and protein rich dessert packed with 260 calories and 20 g of protein in a single serve 118 mL portion cup.

Gelatein MCT is made with MCT oil – medium chain triglycerides – the preferred fuel source by healthcare professionals because it requires less energy for absorption, utilization and storage than long chain triglycerides like corn or soy oil found in most shakes. MCT oil is well tolerated and easily digested. Gelatein MCT is also appropriate for dysphagia patients who require IDDSI level 4 extremely thick consistency.

Gelatein MCT does not require refrigeration but we always recommend that it is served chilled. And, it stays the same smooth consistency regardless of room temperature.

REFERENCES:

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- Dietary whey supplementation in experimental models of wound healing. *Int J Vitam Nutr Res.* 2008 Mar;78(2):70-3. Velicoglu Oguz A, Muesikyan M, Cang A, Eloroglu-Demirag E, Ozdemir Altun A, Saha Tal. in A. Department of Biochemistry, School of Medicine, Turkey.
- Can oral supplementation with a collagen-calcin based hydrolyzed liquid protein improve serum albumin levels in hypalbuminemic hemodialysis patients? *Dialysis and Transplantation: v 36, No 5 2007, 258-265* Aze Pitaoula, RD and Evelyn Phillips, MS, RD, LDN
- Investigation of the Gastrointestinal Tolerance and Compliance to a High Protein, Sugar Free Oral Gelatin Supplement in Acute Rehabilitation Patients at Risk for Malnutrition. Evelyn Phillips, MS, RD, LDN, CDE, Magee Rehabilitation Hospital, Pottsville, PA

The background features a large, light yellow abstract shape that resembles a stylized human figure or a speech bubble, with a circular head and a pointed base. A thin yellow vertical line is positioned to the left of the main text.

Questions and Comments