

GASTROINTESTINAL HEALTH AND THE CHILD WITH FEEDING PROBLEMS

Part 2

THERAPY ALTERNATIVES

Improving Gastrointestinal Health and Comfort

The journey toward change is initiated through an awareness of the new questions that lead toward new actions or behaviors. These questions often challenge current belief systems and the status quo. Most of the questions and observations in the initial portion of this paper are not addressed in therapeutic management by feeding therapists, gastroenterologists, or dietitians. There frequently is very little coordination or interaction among professionals working with the feeding issues of children.

Dietary alternatives which might improve digestion and reduce the need for expensive medications and surgery are often poo-hooed by dietitians and physicians as being too costly in time and money for parents. Multiple medications to reduce reflux may be given before looking at less invasive alternatives such as formula rotation or increased intake of water. The surgical alternatives of a fundoplication or pyloroplasty which alter the ability of food to leave the stomach are recommended when medication does not control the reflux. These procedures often have negative side effects of retching, gagging, nausea, and gas bloat which reduce the probability that the child will ever become an oral feeder.

Insurance carriers are willing to expend huge sums of money for pharmaceutical drugs, hospitalization, surgery, commercial tube feeding formulas, and the rental of expensive pumps and other equipment. When a food or nutritional supplement or a non-commercial formula is recommended at a fraction of the cost, the insurance network refuses to pay, and parents must assume the expenses for these alternatives. Although high quality supplements and home-made formulas are substantially less expensive than their medication alternatives, they can add a substantial cost to the family budget.

Therapists must recognize that gastrointestinal issues impact on their feeding programs. Time and money are wasted each year by initiating behavior modification programs to get children to eat. If the underlying sensorimotor or gastrointestinal reasons for the child's refusal behavior are still present, the program will fail; and additional harm will be done to the child. Feeding programs that introduce children to nutrient-poor junk foods to get them to eat are doing a great disservice. Many of these children learn to prefer or eat only foods and liquids such as candy, ice cream, white bread, highly processed snack foods with chemical additives, and soda pop. They refuse the fruits, vegetables, and whole grain foods that provide the nutrients they need.

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Therapeutic alternatives continue to be explored. There are no pat answers, and protocols must be highly individualized for each child. This paper will discuss general directions which I have found helpful.

Build Toward Diversity in the Child's Diet

Even when a child receives all nutrients through a feeding tube, dietary diversity can be incorporated. If the child's body knows only the one food combination received through the same formula at each meal, it is usually more difficult to introduce variety in oral foods.

Add tiny amounts (i.e. 1/4 tsp.) of different juices or pureed fruits, vegetables, grains, and meats to water or the child's regular formula. In some regions dehydrated fruit and vegetable flakes are also available. Rotate these foods so that a different one is added to each feeding. No food should be given oftener than every fourth day.

Rotate foods and formulas so that the child receives a highly diversified diet (Morris 1989, Morris 1997, Rapp 1991). No typically developing child receives the identical diet at each meal for years at a time. The basic goal is to introduce the gastrointestinal system to very small differences in foods and nutrients at each meal. Ideally no food or formula should be given oftener than every fourth day. Formulas containing different protein, fat, and carbohydrate sources are selected to meet the child's caloric and nutritional needs (Rasche and Thompson 1996). These four formulas are introduced slowly (one at a time) to allow the child's system to adjust to the changes. As formulas are added to the diet, they are rotated so that the child receives a different formula each day for a 4-day period.

Set the initial oral feeding goals for food variety, not food quantity. Offer the child a new food and allow enough time for the child to become comfortable tasting or eating the food. Introduce another food and go through the same process of building comfort and familiarity. Gradually add more foods. Set a goal that the child will accept 4 or 5 different foods in each of the following categories: vegetables, fruits, grains, and a high protein and fat source (i.e. meat, beans, nuts). Offer all of these foods in therapy and at mealtimes using a rotary diversified diet plan.

If the child's diet is limited to processed formulas or is deficient in fruits and vegetables, add phytochemical products which are "live foods." High quality freeze-dried fruits, vegetables, and algae can be mixed with food or formulas. These must be carefully selected from the wide variety that are available through health food stores and multi-level marketing. Many companies

do not use fully ripened fruits and vegetables and others process them in a way that substantial nutrients are lost. The Dietary Supplement Health and Education Act of 1994 (DSHEA) states that manufacturers and distributors may provide consumers with research and educational materials that describe and support their products (when such data exists). Consumers should check out the products they are considering and request specific information on the supplement and the company.

Discuss food supplement and formula alternatives with a registered dietitian or gastroenterologist. Specific nutrients or formula components may be required by a child because of overall health and medical needs. These need to be explored with the professionals who have the broadest experience in dietary and medical management. When formulas are changed or when specific nutrients are added to the child's diet, the child's health should be monitored by a nurse, physician, or dietitian to assure that appropriate weight and health goals are met.

Build Gastrointestinal Comfort

Identify specific foods, food groups, or food combinations that cause or increase gastrointestinal distress. If the child is eating orally, parents can introduce an elimination diet for several weeks to clear the body of the foods most likely to cause allergy (Randolph 1979, Rapp 1991). These include milk, wheat, citrus, eggs, corn, and citrus foods. High allergy-potential foods are gradually reintroduced and careful records maintained of the child's responses before, during, and after the elimination diet.

Explore a formula or food rotation diet. This has already been discussed in the previous section on building toward dietary diversity. If the gastrointestinal discomfort is triggered by an allergic sensitivity to something in the diet, greater comfort may occur when foods and formulas are rotated. This procedure assures that the body is not bombarded daily by the offending food.

Use plant-based digestive enzymes that work in both the acid environment of the stomach and the more alkaline environment of the intestines. Small amounts of these food enzymes are given before and after a meal or are added to a bolus feeding of the formula or a favorite food. They improve digestion and reduce gas formation for many children, making meals more comfortable. Through increasing the efficiency of digestion, they also improve the child's ability to absorb the nutrients from the food.

Explore the use of concentrated dehydrated foods (i.e. phytonutrients and glyconutritionals) that support nutrition and boost the child's immune function. These assist intercellular communication, build resistance to disease, and support many bodily functions. Gastrointestinal discomfort may be a more general symptom of marginal health and digestion. Increasing the child's overall wellness can make a big difference in eating comfort and desire.

Provide more water daily to reduce the risk of chronic subclinical dehydration. Increased water can reduce gastroesophageal reflux, improve digestion, reduce constipation, and cleanse the body through removing toxins. Water should be introduced very slowly until the child takes an amount equal in ounces to 2/3 of their body weight. This should be divided into small portions and given approximately 30 minutes prior to each tube-feeding or oral meal. This may be offered by feeding pump, a syringe or gravity bolus feeding, or orally. It is important to begin with an amount and a rate that is comfortable for the child. This can be very gradually increased over a period of weeks or months. Increments should be very small. For example, if the child is comfortable with 30cc of water (i.e. 1 ounce), the next increase should be 45cc (i.e. 1.25 ounces). Monitor the amount of urine output in diapers or trips to the bathroom. As water intake increases, urination should also increase.

If there is a history of urinary tract dysfunction or a cardiac problem resulting in water retention, the child's physician should be consulted before fluid intake is increased. If the child does not have a feeding tube and must take water by mouth, it is important to rule out aspiration. Carbonated water (i.e. sparkling mineral water) often can be swallowed with a more rapid oral and pharyngeal transit time and with less risk of aspiration. Water is added to the child's diet. It is never substituted for the formula or food that the child is receiving. If too much water is given, especially when food is reduced, a child can develop a serious condition known as water intoxication. Too much sodium is lost in the urine and hyponatremia develops, leading to seizures and other neurological consequences. Many physicians recommend that parents give young infants only breast milk or formula. Older infants can receive additional water, but this must be added carefully.

Increase the child's physical and psychological comfort with a gradual program to expand the capacity of the stomach. This is an important step for children who are on drip feedings and are ready to make the initial transition to some oral feeding. If the sensation of food or liquid in the stomach is associated with discomfort, the child will usually pull back and refuse to eat more than small tastes of the food. Because water does not

require digestion, it leaves the stomach relatively rapidly. If clear spring water or distilled water is used, there is very little risk that the child will be allergic or sensitive to substances in the water. For these reasons water is an ideal substance to use in building the concept of comfort as part of eating.

Identify the child's current comfort level for liquid in the stomach. If the child is taking formula at a pump rate of 60cc (i.e. 2 ounces) per hour, this suggests that in any given period of the feeding that the stomach contains between 1-2 ounces of liquid. Begin water bolus feedings at 50% of the rate per hour. Thus, for a child with a rate of 60cc, begin with a 30cc (1 ounce) water bolus. Use warm or room temperature water, and offer it slowly over a 5-minute period approximately 30 minutes before a scheduled meal. If the child receives a single night pump feeding, offer the water bolus at breakfast, morning snack, lunch, afternoon snack, and dinner time periods (even though no food is offered at these times).

Remember that the primary goal is to provide the child with a positive experience of liquid entering the stomach. Many children have the physiological ability to take a larger amount of food or diluted juice in a single bolus. However, psychologically they may become tense and anxious when this is introduced in bolus form because previous bolus feedings have caused nausea, gas, or vomiting.

The secondary goal is to increase the amount of liquid to 6 ounces in a 5-10 minute period. Gradually increase the amount of water in the bolus, moving at 15cc (i.e. 1/2 ounce) increments. Remain at the new level for at least a week to give the child a new baseline level of gastrointestinal adjustment. Continue until the child can take 5-6 ounces at a time. If the child has the sucking and swallowing skills to handle thin liquids, begin to offer small amounts of water orally with a glass, interesting straw, or in the form of ice chips. Gradually provide less of the total water through the tube, and more through the mouth.

When the child is comfortable with at least a 2-ounce bolus of clear water, add small amounts of juice or pureed fruits or vegetables to the bolus. Begin with 1/8 tsp. mixed with 2 ounces of water. Let the child watch you add the food to the water and talk about how the tummy can be happy with different foods. Use this small diluted juice bolus once a day, and continue to give the clear water bolus at other times. Again, it is important to move very slowly and conservatively because of the child's previous associations with food through the tube.

Reduce physical, sensory, and emotional stress at mealtimes. Stress during meals contributes to poor digestion and gastrointestinal distress. Remember that the tube feeding may be the child's primary meal at this point. If the child has sensory modulation or sensory processing problems, provide vestibular and proprioceptive activities before the meal to help normalize the sensory system. This is particularly important if the child shows any sensory defensiveness which is typically associated with high levels of sympathetic nervous system activity and physiological stress. Position the child for feeding so that the body is appropriately supported. Children should be physically quiet and secure for all meals. Use music that helps the child become more relaxed, focused, and emotionally calm (Morris 1991).

Reduce the Probability of Food Allergies and Sensitivities

When introducing a new food, offer small amounts through the tube before introducing it orally. Observe the child carefully for several days to identify any immediate or delayed negative reactions. Remember that allergic sensitivities can be expressed in all areas of the body. If the child becomes more irritable, has a stronger tongue thrust, or more reflux vomiting, it may be related to the new food. This procedure allows you to identify a questionable food before it is introduced by mouth. If a negative reaction occurs, it is better for the child to associate it with the tube feeding than with oral feeding. If there are any questionable or negative physiological responses to a new food, do not offer it in the oral feeding program.

Introduce only one new food at a time. Allow four days before offering another new food. Initially offer foods with a low probability for allergy. Offer higher allergy risk foods later in the program. For example, apples and bananas are in the low risk group. Offer them before considering using a higher risk fruit such as orange juice. Children with sensory issues who often are interested in crunchy snack foods can be offered rice crackers (low risk) prior to wheat crackers (high-risk). Almond butter can be used in place of peanut butter.

If the child is already taking food orally or receives a blended food homemade formula, consider a trial period in which potentially offending foods can be eliminated (Randolph 1979, Rapp 1991). Begin with high risk foods such as cow's milk, soy, eggs, wheat, citrus, and yeast. Add foods back one at a time to identify foods which are contributing to the problem.

Prevent the development of food sensitivities in vulnerable children by working toward dietary diversity, and rotating foods and formulas whenever possible. Consider a blended food diet as an alternative to processed commercial formulas. These formulas can be developed with the help of a registered dietitian who can monitor the diet for calories and nutrients required by the child. Bolus feedings of most blended diets require a feeding tube with a diameter of at least an 18 French diameter.

Incorporate a plant-based digestive enzyme at each meal to enhance complete digestion, and reduce the possibility of partially digested food molecules passing from the digestive tract into the blood stream.

Address the possibility of the overgrowth of the yeast, *Candida albicans* in the digestive tract. This is a high probability for children who have been on antibiotics for frequent ear and other infections. It is a certainty for children who receive prophylactic doses of broad spectrum antibiotics such as Bactrim and Ceclor. Work with a physician or dietitian to develop a daily program in which probiotic supplements are used to repopulate the gastrointestinal tract with friendly bacteria. The specific bacteria offered will depend upon the age of the child. Bifidobacteria are used exclusively with children under the age of 2 years. Older children may receive a mixture of lactobacilli including *Bifidobacteria*, *Lactobacillus acidophilus*, *Lactobacillus bulgaricus*, and *Lactobacillus casei*. A special food for bacteria called FOS (fructo-oligosaccharides) can be added to the diet to promote the growth of friendly bacteria such as the Bifidobacteria.

Chaitow and Trenev suggest in their book, *Probiotics* (1990, p 178-184) that for supplements to be valuable and take up residence in the gastrointestinal tract there have to be billions of organisms and they have to be of strains that will survive digestion. They state that not all probiotic supplements meet these criteria. Buyers should check that the number of viable organisms must be several billion per gram. Because the organisms have a limited survival period, an expiration date should be on the label. Products which have been refrigerated are more likely to remain potent and stable. Powdered products are more stable and have a slower deterioration than liquid products. The product label should always indicate which strains of bacteria are present.

Support the development of a strong immune system, and reduce the overall incidence and severity of illness through a strong wellness program. Seek alternatives to antibiotics, and use these when the child has a viral illness or a non-lethal bacterial infection (Zand et al 1994, Schmidt 1990). Reserve antibiotics for the serious

bacterial infections for which they are effective (Schmidt et al 1993). Options which can be considered are homeopathy, dietary modifications, herbal medicine, massage, accupressure, phytonutritionals, and glyconutritionals. Colloidal silver has strong antibacterial and antiviral properties and can be used in place of an antibiotic for less severe infections. Aloe vera, echinacea, vitamin C, and garlic are known to increase immune system function and reduce the severity of illness.

Develop the Child's Internal Regulation of Eating

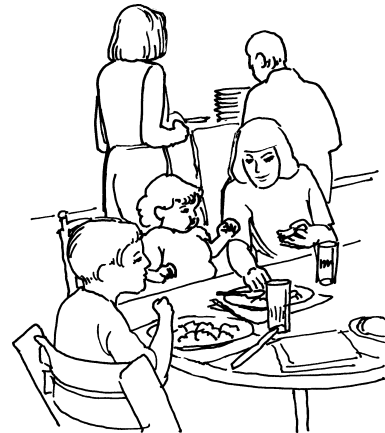
Help parents understand the sensory, motor, and gastrointestinal issues that impact on their child's desire to eat. Introduce strategies that families can incorporate at home to help the child develop greater comfort in these areas. Offer support to reduce distraction at mealtimes and direct the child's independence and curiosity into a positive relationship with food and mealtime stimuli.

Avoid external pressures directed toward getting the child to eat. Pressuring the child shifts the responsibility for eating from the child to the adult. Adults are responsible for offering appropriate food to the child and setting the time and place for meals, but the child is responsible for what and how much is eaten (Sater 1987). It is critically important to honor this mealtime partnership in helping children move toward independent eating. When pushed to eat, children push back and a power contest is initiated with the will of the child pitted against the will of the adult (Sater 1987, Dreikurs 1967) Adults always lose power contests because children have an inner drive to win, and have 24 hours a day to devote to the endeavor!

Help the child develop an awareness of hunger and fullness signals. Build the association of these physiological signals with the need and desire to eat and with the comfort that follows eating. Focus the child's awareness on the tummy before the meal. Talk about how the body lets the child know it is time to eat. If the child receives bolus tube feedings or oral feedings at regular intervals, assume that hunger signals are present. Help the child interpret these signals as a message from the body that it is time to eat. During tube feedings, help the child learn the body signals of increasing fullness or satiation. This may be done initially with a water bolus feeding to help the child distinguish between fullness and gastrointestinal discomfort. Incorporate the suggestions offered in other sections of this paper to build physiological comfort and positive associations with eating.

If the child is taking the formula through a slow pump drip feeding, hunger and satiation signals will be minimized. If the feeding continues over a 10–24 hour period the child will not experience these signals in association with eating. When possible, begin to introduce water bolus feedings as described in an earlier section of this paper. This may enable the child to accept either a faster pump rate during tube feedings or accept some bolus feedings of the formula. The addition of foods and formula to the water must be done very, very slowly so that the child's body has time to adapt. The long-term goal is for the child to receive a full bolus meal in a 15–20 minute period. Tube feedings should be scheduled with three larger feedings and two smaller feedings throughout the day. This mimics the breakfast, lunch, and dinner and morning and afternoon snacks of the orally fed child.

Some professionals recommend that the child receive all tube feedings while asleep at night, leaving the daytime for the development of hunger and desire to eat orally. However, this allows no time for the digestive system to rest and recuperate. The morning meal is called "breakfast" because it is the meal which breaks the 8–12 hour fast for the digestive system.



Help parents set limits around mealtimes. It is not appropriate for a child to pull the tube out or run around during a tube feeding. Just as these types of behavior would not be acceptable in an orally-fed child, adults can guide the tube-fed child in learning appropriate mealtime behaviors. Children can receive their tube feedings at the table, and learn to associate eating with a shared social time. They can learn to sit in the highchair or booster seat for the duration of the mealtime. They can learn what is appropriate and what is inappropriate at mealtime, just like any child. Young children who throw toys, food or utensils can be given an "all done dish" for items they no longer want. This gives a positive alternative for saying "I'm done" when other means of communication are lacking. Limits are set on throwing, and this behavior is not acceptable during mealtime.

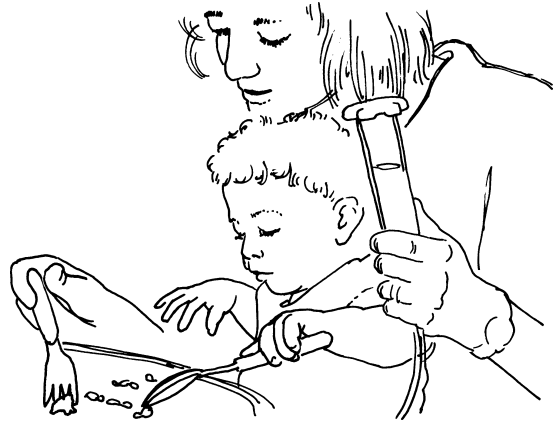
At times children may be removed from the table to a quiet area to reduce overstimulation and allow them to regain emotional balance and learn self-calming before continuing the meal. This is done in a matter-of-fact way in which the child is not judged, criticized, or punished. The behavior is simply inappropriate and will not be accepted at the mealtime.



When the child is ready to accept some foods orally, small servings should be offered to taste or eat. Placing small amounts on a plate gives an opportunity to finish the helping and ask for more. This gives the child a sense of accomplishment and control. Self-feeding of finger foods, spoon feeding, and drinking from a cup or a straw also gives the child full control of the decision to eat, and reduces the opportunity for power contests to develop.

Avoid enticing the child to eat “just another bite” or offering desserts and other sweets as a reward for eating the meal. Children must be given the opportunity to discover hunger and satiation and use this to regulate their food intake.

These gastrointestinal components must be addressed in every feeding program. They will be blended with the more standard sensorimotor and oral-motor strategies to increase the motor and sensory skills that support comfort and competence in eating.



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Nutritional References

These are companies and nutritional products we have used and liked in our New Visions programs. They have been used with the recommendation of a consulting dietitian or physician. These are not the only companies which provide health promoting products. It is critically important to investigate the companies whose products you purchase. With the current popularity of food and nutritional supplements, there are many products on the market which are ineffective or have questionable manufacturing or safety standards.

Mannatech has focused on the development of nutraceutical products, the term developed by the Food and Nutrition Board of the Institute of Medicine to describe functional food products with a proven relationship to health maintenance. This is a company with a strong research base and a solid history of commitment to safety and efficacy in its glyconutritional and phytochemical product development.

Ambrotose[®] belongs to a new category of nutrients known as glyconutritionals. Healthy bodies comprised of many components working together in harmony must have accurate internal communication to function correctly. In its most basic form this communication occurs at the cellular level, as cell-to-cell commu-

nication. Recent research has shown when carbohydrate (glyco) molecules attach to protein stems, they become the glycoproteins that facilitate cellular communication. Cells communicate their needs to be fed, regulated, cleansed, repaired, defended, and recognized. Eight carbohydrate molecules have been identified as necessary in cell-to-cell communication. The average diet provides only two of the necessary carbohydrates. Although a healthy body can produce these other carbohydrates, the process can take up to fifteen steps requiring time and energy, and each step creates a larger margin for error. Many elements such as toxins, stress, drugs, viruses, and other invaders can interfere in the conversion process. When the intricate language of the cell is garbled so that the message is no longer clear, health problems can occur. Ambrotose is a proprietary supplemental blend of the eight necessary carbohydrates that support good cell-to-cell communication. As cell-to-cell communication is enhanced, the level of health is increased. Ambrotose complex received the American Naturopathic Medical Association (ANMA) Biochemistry Discovery of the Year Award in 1996. Research shows that Ambrotose has no toxicity and provides significant immune system support, synthesized by the healthy body. Ambrotose is available in capsules or a bulk powder that makes it easy to mix with liquid for oral or tube-feedings.

PhytAloe® combines flash-dried fruits and vegetables containing the highest level of phytochemicals as determined by research, plus Ambrotose™ complex. These include broccoli, brussels sprouts, cabbage, carrot, cauliflower, garlic, kale, onion, papaya, pineapple, tomato, and turnip. Each capsule includes the equivalent of an 8-ounce glass of these juices. Research has shown that 80% of the vitamins and minerals and 90% of the phytochemicals of the original vegetables are present in the capsule. Capsules can be emptied and mixed with food or added to a tube feeding formula. Bulk PhytAloe is also available.

PhytoBears® contain the same ingredients as PhytAloe® in a chewable gummi-bear like product. No refined sugar or artificial colors are included, making it a wonderful way to supplement a child's diet with the beneficial components in the PhytAloe® capsules. These nutritious bears are great for kids who can chew. They also offer an health-promoting product to use when teaching resistive chewing to children with mild feeding difficulties. Kids love PhytoBears®!

Cell Tech harvests and processes the valuable nutrients in the blue-green microalgae *Aphanizomenon flos-aquae*. This plant grows in a canal flume coming from Upper Klamath Lake in Oregon. Cell Tech is meticulous in its testing process, assuring that all blue green algae used in its products is non-toxic and safe.

At the bottom of the food chain, blue green algae is a powerful food which contains complete and balanced levels of amino acids, protein, chlorophyll, and an abundance of vitamins, minerals, and trace minerals. It is a major source of beta carotene which fortifies the body's immune system, B vitamins which contribute to stress reduction, and a wide variety of phytonutrients.

Super Blue Green™ Alpha Sun is flash-dried whole algae which is high in minerals and glycogen which changes to energy as we need it. Alpha Sun acts primarily on the body and helps with overall functioning of body systems.

Super Blue Green™ Omega Sun begins as whole algae. Sound frequencies break down the cell wall of the algae which is then removed from the intracellular portion. This results in the release of smaller protein particles that are able to pass through the blood-brain barrier. Omega Sun acts strongly on our mental and emotional processes, contributing to stress reduction, and improved mental focus and concentration.

Super Blue Green™ Enzymes combine highly active food enzymes derived from vegetable sources with freeze dried Super Blue Green™ Alpha Sun. The combination is used as an aid to digestion of all types of food including protein, starch, fat, lactose, and fiber.

Nature's Source produces a digestive enzyme product that increases the absorption of nutrients, increases the efficiency of digestion, and reduces the impact of gastroesophageal reflux. **AbsorbAid™** consists of "stabilized plant enzymes" that have been bio-engineered to resist stomach acid. This enables them to be active in both the acid environment of the stomach and the alkaline environment of the intestines. Because greater digestion is enhanced in the stomach, food will pass more quickly into the intestinal tract, reducing the probability of reflux into the esophagus and heartburn. Blood serum tests performed by major laboratories confirmed that AbsorbAid increases the blood serum assimilation of vital nutrients. Zinc absorption was increased by 71%, linoleic acid by 50%, selenium by 20%, and vitamin B6 by 15%.

Papayazyme™ from Arise and Shine is made from 100% freeze dried green papaya, one of the richest sources of papain, a digestive enzyme used by the body to digest protein. Enzymes are the catalysts in digestion and absorption, speeding up and enhancing the breakdown of foods. Gastrointestinal discomfort can result from foods that are not digested efficiently. Many children with gastroesophageal reflux are more comfortable when papaya is added to their diet.

Nutri-Rice Solubles™ from Golden Sunrise is 100% premium rice bran, stabilized by a natural process

without the use of chemicals or preservatives. It is easily assimilated providing vital nutrients, all occurring naturally. Rice bran is one of the richest sources of essential amino acids, vitamins, minerals, essential fatty acids, and anti-oxidants. Nutri-Rice can be added to formulas and foods to provide additional nutrition and calories.

Fruit-Eze™ (from Fruit-Eze) is a delicious tasting fruit paste that is a 100% natural mixture of prunes, dates and raisins. Kids love it straight from the spoon, mixed with milk or yogurt, or spread on crackers or toast. Fruit-Eze creates a soft stool by preventing fecal material from drying and hardening. It promotes a healthy lining of the colon by providing lubrication, and speeds stool transit time. It acts as a natural laxative through the breakdown of soluble fiber into fatty acids.

Product Sources

The New Visions Mealtimes catalog carries many of these products.

For further information contact:
New Visions – (800) 606-3665 ext. 10