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1 Introduction
The human intestines are populated by huge numbers of microorganisms, both bacteria and fungi. These constitute the “bowel flora”. Our health is profoundly affected by the composition of this population. Some produce toxic products that we absorb into the blood to be circulated through our bodies. Others produce essential nutrients and contribute to our nutrition.

In or around the year 1907 El Metchnikoff observed that Bulgarian peasants who consumed large quantities of fermented milk exhibited greater than usual longevity and good health. Indeed, there was a folklore tradition concerning a relationship between good health and yogurt consumption. Eventually this was replaced by scientific research that showed that it was primarily through the multiplication of Lactobacilli in the milk that benefits were obtained. Today we know that we also have to address the related Bifidobacteria as being similarly beneficial organisms.

These types all act by generating lactic acid, thereby creating acidic conditions that favour this class of organism while tending to exclude the disadvantageous putrefactive, alkali-loving toxin-producing types. They also produce specific biochemicals that inhibit pathogenic types of organism.

Hence, enhancing the bowel flora with the best types of organism favours improved cellular function throughout the body.

2 The Bowel as a Source of Illness Predisposition
Naturopathic practitioners have long claimed that the origins of chronic illness are centred upon the bowel, or colon. The chronic bowel was one afflicted by a population of organisms of the wrong kind and subject to bulging, with relative stasis of its contents. Such a bowel is seen as contributing a constant stream of toxic material into the system. In their writings we get an insistence upon disease treatments using either enemas or more thorough approaches to bowel washing, such as the “colema”, designed to wash these toxins away (Jensen 1981). Jensen, has reported how his colema technique, which included treatment with herbs as well as washing, could dislodge old, long-encrusted material that had been clinging to the bowel wall and cause it to be passed to the outside, leaving a clean bowel wall behind. Since Jensen’s work much attention has been focused upon seeking means to produce a cleansing effect akin to that of the colema without going to quite so much personal abuse. It is well known that most antibiotic drugs just how decisive this issue can be. By purposely altering the bacterial population (Probiotics) a wide range of bad health conditions may be reversed or prevented. The treatment involved is essentially nutritional because the bacteria affect you by determining, to quite a large degree, what substances you absorb into the blood stream from the bowel. Wide issues of food, nutrients and lifestyle are involved in getting the bowel conditions right. Care of the bowel flora is therefore one aspect of an overall nutritional programme that has many facets.
Bowel Flora FAW:Layout 1  26/7/11  14:35  Page 4

Bifidobacteria of the bowel, leaving an opportunity for other species to proliferate and replace them. Antibiotic use is very widespread indeed in our society, these drugs frequently being used in a cavalier manner and without due consideration to the long-term consequences. Certainly we should aim to reinstate the original flora after antibiotic use. For this purpose cultures of live lactose-fermenting bowel organisms are required. Deterioration of the flora similar to that caused by antibiotics is also reputed to occur as a result of other aspects of lifestyle mismanagement. These comprise poor diet, use of steroids including the contraceptive pill and excess alcohol or tobacco smoking. So, the naturopathy picture presents us with a dark image of these entirely undesirable processes occurring in the bowel. These adverse bowel conditions are termed “dysbiosis”. They are bound to escape through the bowel wall to be absorbed and thus to incite the essential organs, especially those involved in detoxification, such as the liver and the kidneys.

The word “putrefactive” is used by naturopaths to describe the activities of many of the less desirable bacterial species. Rectification of the underlying bowel condition is seen to be through correct diet that is toxin-free as far as possible, i.e. a healthy lifestyle, active detoxification and, above all, bowel cleansing with replenishment of desirable bacterial species.

3 The Meaning of “Putrefaction”

The word “putrefactive” is used by naturopaths to describe the activities of many of the less favourable, non-lactose-fermenting organisms in by the reaction of decarboxylation, which is the removal of one or more carbonyl groups (COOH) while the amino groups remain. These amines include tryptamine, histamine, cadaverine, agmatine, octopamine, pipertazine, putrescine, pteroidine, indole, isoaaspartylamine, ethylamine, phenylethylamine and skatole. Thus tryptamine comes from the amino acid tryptophan, histamine from histidine, ethylamine from alanine, isoaaspartylamine from leucine and phenylethylamine from phenylalanine. Still others have more complex derivation.

The process of decarboxylation that produces these amines from amino acids is quite simple. In the process the amino acid molecule loses a carbonyl group –COOH and carbon dioxide, CO2 is eliminated, contributing to the gas production. It is the quite simple chemical step that produces putrescine, a diamine derived from the amino acid ornithine. The amine, in the simplest cases, corresponds to the original amino acid with the carbonyl group removed.

There is no doubt about the toxicity of the resulting amines. They contribute significantly to hepatic coma in cirrhosis of the liver, indicating that the healthy liver is constantly detoxifying the amines, which only become a threat when the liver is compromised. Obviously, though, any overgrowth in the types of bowel organisms that decarboxylate amino acids would threaten the liver. A vicious cycle can develop in which the liver is intoxicated by a heavy output of amines. When this is very extensive the liver’s ability to detoxify is threatened. In such a position, the liver may fail quickly as it is overwhelmed by some of the very toxins it would normally detoxify.

Some of the other toxins the flora produces are phenols. The word “putrefactive” is used by naturopaths to describe the activities of many of the less favourable, non-lactose-fermenting organisms in the intestine.

4 Identifying the Adverse Bacterial Types

It is true, as many of the naturopaths alleged, that lactofermenting bacteria break down protein or, if not protein, then peptides that are partial breakdown products from protein. These organisms include Clostridium, Propionibacterium, Eubacterium, Bacteroides, Fusobacterium and Pectobacterium. In addition, Clostridium, Fusobacterium, Escherichia coli, Bacterioides, Peptostreptococcus and Lactobacillus. Peptostreptococcus and Acidaminococcus are known to breakdown amino acids, some deaminating and others decarboxylating them. Those that make gas are known to include Clostridium, Propionibacterium, Peptostreptococcus, Aerobacter, Streptococcus, Escherichia coli and Bacillus, while Proteus, Sphaerophorus, Paracolobacterium, Bacterioides and Escherichia coli produce indole.

It is amazing to find that Escherichia coli (E.coli), although usually present, does not account for any significant proportion of the count. This seems peculiar since many orthodox textbooks are written as though E.coli were far and away the dominant organism of the bowel and is E.coli that is so vilified by Jensen as the protein splitting, toxin producing “king of the court”. This goes to show us how both orthodox and alternative mouthpieces can, on occasion, take extreme stands, neither of which approximate to the truth.

The majority of readers may well be unfamiliar with many of the bacterial genera named above but they do not distrubute any other types that most naturopaths favour. Below we take a look at the list of these most-favoured types.

5 By Contrast – Which are the Favourable Organisms?

The types of bacterial genera that ferment lactose sugar and produce acid are identified as Lactobacillus and Bifidobacterium, with some account being taken of Streptococcus thermophilus, because of its association with yogurt. These are usually regarded as exerting favourable influences upon health. These may be referred to in more popular presentations as “beneficial” bacteria or even as “friendly bacteria”. The names Lactobacillus and Bifidobacterium will occur so frequently in this text that they will be abbreviated, wherever a full systematic name is given, so that Lactobacillus becomes “L” and “Bifidobacterium” becomes “B”.

The principal species of lactose-fermenting bacteria that occur in nutritional writings are L. acidophilus and Bifidobacterium bifidum. It is of the utmost importance to note that these are not the same species as L. acidophilus that is so favourably presented. L. acidophilus, or “beneficial” L. acidophilus, is a member of the intestinal flora of the cow and is not a human gut microbe.

Both orthodox and alternative mouthpieces can, on occasion, take extreme stands, neither of which approximate to the truth.
Evidence that flora organisms make a contribution to host vitamin nutrition is strongest in the case of folic acid and Vitamin K. The bowel flora may, indeed, make a significant contribution of these two vitamins. In the case of panthenolic acid (Vitamin B5) rats could only utilize this vitamin from their bowel microbes by coprophagy (eating faeces). The evidence regarding thiamine (Vitamin B1) is insecure, even though the organisms certainly synthesize it, and the cases for B2 and B6 are also uncertain.

In terms of appearance under the microscope, the Lactobacilli are typically long slender rods but may revert to a shorter more rounded form. They were shown to inhibit growth of pathogenic strains of Cryptosporidium parvum in mice (Alak et al 1997).Cryptosporidium parvum infection gives real cause for concern because the organism may be present in water supplies. In 1993 an epidemic outbreak of this trouble, termed "Cryptosporidiosis" occurred in Milwaukee, Wisconsin and 400,000 cases were reported. The threat is much greater than it otherwise would be because the organism survives chlorination treatment. In research reports dated 1996 and 1997 it was shown that those people who had deficient immune function were helped to avoid infection when exposed to C. parvum if they were fed a preparation of Lactobacilli.

We concentrate mainly upon those favourable organisms that can establish themselves and colonize the intestine.

Evidence that flora organisms make a contribution to host vitamin nutrition is strongest in the case of folic acid and Vitamin K.

There is sound evidence to assert, as the pathopsychologists do, that high counts of acid-producing organisms militate against the development of high alkali-producing populations. It is reasonable to suppose that there must be an on-going contest in the intestinal lumen in which each group of organisms tends to promote the pH that suits its activity the best.

6.2 Production of Antimicrobial Biochemicals

There is a naturopathic theory that has a bearing on the question. The pathopsychologists do, that high counts of acid-producing organisms militate against the development of high alkali-producing populations. It is reasonable to suppose that there must be an on-going contest in the intestinal lumen in which each group of organisms tends to promote the pH that suits its activity the best.

6.3 Osteoporosis

Lactobacilli, the ability to produce hydrogen peroxide, H2O2, a powerful oxidizing agent that may well discourage many other organisms.

6.4 Immune Enhancement and the Bowel Flora

There is ample evidence that taking in cultures of Lactobacilli and Bifidobacteria that must make a contribution to host vitamin nutrition is strongest in the case of folic acid and Vitamin K.

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This, then, is one basis upon which we may suppose that Lactobacilli and Bifidobacteria are able to wrest the growth and activities of non-lactic, non-acid-producing organisms. This would be a rather generalised suppression of those organisms that produce substances that are incompatable with their continued rapid growth and reproduction. Indeed, one aspect of the Lactobacilli and Bifidobacteria that must make them more important than other acid producers in the flora is the fact that they can withstand a considerable accumulation of their own acidic products. This is not necessarily true of other organisms that produce acids. However, over and above that effect, there is plenty of evidence that Lactobacilli produce specific substances that inhibit the growth of pathogens, i.e. organisms that generate bacterial diseases. The benefit to the host is obvious.

They produce anti-biotics that are most strongly associated with L. acidophilus. The metabolite products referred to have been named lactic diplococcin, lactolin, acidophilin, lactocidin and acididin. Another substance, bulgaricin, has been isolated from Lactobacillus bulgaricus. These substances are typically isolated, for research purposes, from filtrates of cultures of the

Evidence that flora organisms make a contribution to host vitamin nutrition is strongest in the case of folic acid and Vitamin K.

Lactobacilli concerned. Clearly, then, this finding regarding L. acidophilus strongly supports the use of this species as a treatment agent. Other Lactobacillus species may well produce such substances but most have not been tested.

There is ample evidence that taking in cultures of any one of several Lactobacillus species reduces the faecal count of putrefactive and pathogenic organisms (Speik, 1975). L. acidophilus strains were shown to inhibit growth of pathogenic strains in the tissues and would tend to be stabilized by avoiding acidosis. This viewpoint, however, is not yet secured by evidence.

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Bowel Flora and Therapy: Probiotics

There are, however, plenty of non-specific reasons for wanting to give Lactobacilli or Bifidobacteria to such patients anyway, simply on the grounds of reducing toxicity coming into the body from the lower gut. This evidence serves to elaborate upon a picture in which bowel flora supplementation is already seen as toxinreducing, pathogen resisting and immuno-stimulating. This strong evidence tends to favour the concept of administering these live organisms and/or their anti-tumour secretions to cancer patients, to those at risk from cancer and to those with chronic illness generally.

The use of bowel flora products has been widely suggested in cases of chronic fatigue syndrome, an extremely debilitating immune state, and these products have been indeed widely used for this purpose by naturalpathists and other alternative practitioners (DeSchepper 2001). We should note that the established benefits of Lactobacilli and Bifidobacteria are impressive. It is by no means unlikely that the named diseases listed by Chaitow and Trenev are being administered by bowel flora organisms, but there is a need for further research.

6.6 Effects of Lactose-Fermenters upon Blood Cholesterol

There is considerable evidence of an anti-cholesterolemic effect from yogurt and Lactobacilli. Mann & Spoor (1974) reported that despite consuming large quantities of saturated fat and cholesterol through fermented milk and meat, the Massai tribes of Africa had fairly low serum cholesterol levels. Hepper et al. (1979) also conducted a trial of yogurt feeding on haemorrhage and volunteers and found a significant reduction in serum cholesterol within one week. Mann (1977) was able to demonstrate presence and clarity that antichoesterolemic factor in yogurt. Also, working with the single species, L plantarum, Bukowska et al. (1998) were able to demonstrate in a clinical trial that administering the live organism reduced the serum level of LDL cholesterol (low-density lipoprotein cholesterol). LDL cholesterol is the fraction of blood cholesterol that is particularly closely associated with risk and incidence of atheroma and heart disease and so it is a very important health parameter. L. sporogenes was used by Mohan et al. (1990) in a small-scale clinical trial with 17 patients and was found effective in reducing LDL-cholesterol to HDL cholesterol ratios. HDL stands for high-density lipoprotein and its ratio to LDL is a sensitive indicator of heart disease risk. Gilliland et al. (1985) found that L. acidophilus can assimilate cholesterol directly in the gastrointestinal tract and may thus remove cholesterol by metabolizing it, while lactic acid incorporates cholesterol into its own cellular membrane (Dambekold & Gilliland 1988). Also L. reuteri has been found to exert an anti-cholesterolemic effect in three research papers (De Smet et al. 1998, Taranto et al. 1998 and Taranto et al. 2000).

These researches have been carried out using a variety of species. Some of these researches need to be repeated using the Lactobacillus species that are most effective in inhibiting aberrant crypts and tumours in animals. (Brady et al. 2000). Aberrant crypts are a pre-malignant histological sign. Inhibition of colon cancer in rats by L. longum was also demonstrated by Singh et al. (1997) and Reddy (1998). Studies have also been made on lacticfermenting species in the form of fermented milks affecting colon cancer cell lines in tissue culture (Baricault et al. 1995). The most efficacious in inhibiting the cancer cells were L helveticus and Bifidobacterium.

6.8 The Bowel Flora and the Digestive System

Chaitow and Trenev take these immunological effects of supplementary bowel flora much further. According to them there is a marked antiviral effect associated with L. acidophilus against poly virus, vaccinia virus and herpes. Research in the USA by Hamdan & Miojaciak is quoted but with no reference. They also take the matter further in terms of associating the immunological benefits of bowel flora treatment with ankylosing spondylitis and with rheumatoid arthritis. Because the bowel flora treatments with L. acidophilus and other Lactobacilli have immunological effects, Chaitow and Trenev argue that they probably relieve the immune error or imbalance that is at the core of “autoimmune diseases”. These comprise a substantial list of diseases in which the immune system attacks a constituent of the body itself. That is to say, there is a failure to distinguish self from non-self, which is what the immune system must constantly do to function correctly. Of course, if this were so there would be many other autoimmune diseases to be treated in the same manner. However, it is a very large claim indeed, to suggest such a major immunological effect based upon little evidence. There are, however, plenty of non-specific reasons for wanting to give Lactobacilli or Bifidobacteria to such patients anyway, simply on the grounds of reducing toxicity coming into the body from the lower gut (see section 7).

This is because, in a high cholesterol society, lowering blood cholesterol improves the quality and fluidity of the cell membranes. Hence keeping blood cholesterol down, especially LDL cholesterol, appears to contribute towards maintaining cellular health and hence avoiding chronic disease generally. Reduction of LDL cholesterol to HDL cholesterol ratios is a particularly sensitive parameter of improving blood lipid pattern. All in the vitro and in vivo studies have been carried out using a variety of lactobacilli and bifidobacteria products. However, the evidence presented clearly show that both lactic acid producing and transient bowel bacteria benefit one’s cholesterol status (Ly et al., 2009).

6.7 Detoxifying the Liver or Stimulating it’s Activity

The naturalpathic scenario includes the assertion that bowel flora treatment with Lactobacilli or Bifidobacteria has a beneficial effect, not only on the bowel, but also upon the function of the liver. This comes as no surprise. The toxins from the bowel pass via the hepatic portal vein directly to the liver. Although it is the function of the liver to process and detoxify these toxins, the liver itself is vulnerable to intoxication if the toxin load is too high. The possibility that administration of the bowel flora organisms will reduce the toxins load is really sufficient to explain why the liver may respond by detoxifying itself and being in a better condition to detoxify the blood. We do not have direct evidence for this from experiment, but it is at least a reasonable hypothesis that also fits the message that lactic acid-producing bacteria tend to benefit one’s cholesterol status seems clear.

We now know that controlling blood cholesterol is a key, not only for heart disease, but also for keeping to keep cells in better condition generally. This is because, in a high cholesterol society, lowering blood cholesterol improves the quality and fluidity of the cell membranes. Hence keeping blood cholesterol down, especially LDL cholesterol, appears to contribute towards maintaining cellular health and hence avoiding chronic disease generally. Reduction of LDL cholesterol to HDL cholesterol ratios is a particularly sensitive parameter of improving blood lipid pattern. All in the vitro and in vivo studies have been carried out using a variety of lactobacilli and bifidobacteria products. However, the evidence presented clearly show that both lactic acid producing and transient bowel bacteria benefit one’s cholesterol status (Ly et al., 2009).

The naturalpathists’ clinical experience. In fact the Bifidobacteria are seen as having a more “life-evident” role than the Lactobacilli and as being likely to provide more cleaning and stimulation to the liver. This is a special justification for using the Bifidobacteria in addition to Lactobacilli and hence for combining the two genera into the same product for use.

6.8 The Bowel Flora and the Digestive System

Bowel flora products are so frequently placed into the class of “digestive aid” that it is no surprise that digestion figures largely in the public image of these products. This is fairly well-deserved.

There is, of course, wide variety of possible digestive symptoms that may occur when digestive function is abnormal. These different symptoms may be cross-connected in complex and diverse ways, for the digestive system is a complex integrated system with each part affecting others via both hormonal and nervous mechanisms. Whilst improvements in digestion may sometimes be gained by a piecemeal and symptomatic approach, a holistic approach to the overall working of the digestive system is far more likely to be effective and lastingly effective. It can help us to understand this more holistic approach if we look briefly at the action of Aloe...
Vera in the intestines and use that research to better understand the contribution of the bowel flora.

Here we refer to the work of Bland (1985), in these experiments Bland reported upon the beneficial effects of administering to human subjects about 570ml unconcentrated Aloe Vera juice daily divided into 3 aliquots of 187ml. The duration of the test was only 7 days and no special measures were taken with regard to diet during the test period. Several parameters were measured, which, taken together, were regarded as providing as a good and reliable index of the functioning of the gastrointestinal system. These were:

- stool culture (a test culture of bowel bacteria to indicate the distribution of bacterial types present in the person’s intestines)
- levels of indican in the urine
- stool density
- bowel transit time and
- gastric pH

The fact that Aloe Vera was employed in the tests was incidental. This therapeutic herb appears to be one way to influence the flora but the indications are that in this case it influenced gut pH and, through that medium, the composition of the bowel flora. Introducing treatment with live bowel flora organisms is very similar in its effect. Certain individual species of Lactobacillus, for example, to the species L plantarum (Bengmark 1980). The Candida, whilst it is always present in the intestines, cannot compete with these desirable lactose-fermenting organisms favourably and is acting rather like the aloe in the Bland experiment. This has been blind to apply, for example, to the species L plantarum (Bengmark 2000).

The ability of live Lactobacilli to ease digestive symptoms may be quite widespread among different species but has only been unequivocally demonstrated in a few. L rhamnosus, for example, has been shown in a review by Gorbach (2000) to benefit cases of traveller’s diarrhoea, infantile diarrhoea, colitis caused by Clostridium difficile and diarrhoea associated with the use of antibiotics. This organism also reduces the permeability defects in the intestine brought about by consumption of cow’s milk. The same range of infection that carries with it implications that gastric function and pancreatic function have been improved by the Aloe Vera, the bowel flora composition improved and, correlated to that, bowel contents pH and putrefactive activity reduced.

The stool cultures indicated an improved composition of the bacterial flora of the gut following the Aloe Vera test. It is interesting that this improvement was attained without the use of bowel flora products containing supplements of live bacteria. Clearly, the Aloe Vera itself was creating conditions within which a better spectrum of bacteria could survive and grow. The advantages of this are well known to nutritionists, and are clearly linked to lower putrefactive activity as outlined above. One especially interesting finding was that the yeast count in the stool was reduced, or possibly both. The indican level was being used to assess the effect of a bowel putrefactive activity was reduced.

The results indicated about a 40% reduction in the urinary indican levels as a result of using the Aloe Vera in the intestines and use that research to better understand the contribution of the Candida and other putrefactive organisms. The truly alternative and holistic way of looking at Candida involves recognizing that the infection is the end-result in a long process of health deterioration.

170ml unconcentrated Aloe Vera juice daily, 1 day in 3. This was taken to indicate that the urinary indican levels as a result of using the Aloe Vera in the intestines and use that research to better understand the contribution of the Candida and other putrefactive organisms. The truly alternative and holistic way of looking at Candida involves recognizing that the infection is the end-result in a long process of health deterioration.

The stool cultures diminished markedly, indicative of protection against Candida.

The truly alternative and holistic way of looking at Candida involves recognizing that the infection is the end-result in a long process of health deterioration.
concentration, depression, extreme sensitivity to chemicals, perfumes and fumes, fungal infections of nails or skin, endometriosis, impotence, muscular aches or swollen or aching joints, allergic symptoms, upper respiratory tract infections, erratic vision. An infection that can produce such terrible symptoms is the one that matters that can disrupt lives. The fact that it can be traced to a bowel flora upset (dysbiosis), which can usually be kept at bay by using high quality bowel flora products underlines the far reaching importance of maintaining a good bowel flora as a fundamental health.

7 Abatement of General Chronicity

The wide range of potentially beneficial effects reported for cultures of lacto-fermenting organisms must be explained via mechanisms operating within the intestines. As these organisms do not pass through the intestinal lining their influence must be exerted through substances that they cause to be generated in the gut or substances whose production in the gut they inhibit. There are research reports on the anti-oxidative properties of these bacteria. Such properties may well affect the metabolic products from the lactose-fermenters themselves or from the non-lactose fermenters and pathogens whose biology they alter.

The tumour-inhibiting substances from lactose-fermenters must at least reach the cells of the bowel wall to have any anti-carcinogenic influence, but it is not known whether they penetrate further into the body. Reduction of blood cholesterol seems to be the affected through the organisms themselves using up cholesterol in different ways. However, the literature is best understood if one views the greatest effect of the lactose-fermenters to be the suppression of toxin production from the non-lactose-fermenting and putrefactive components of the bowel flora.

One can then account for the efficacy of bowel flora products by a reduction in the concentrations of toxic bacterial products locally in the intestine and also systemically. That can be viewed as ensuring an improved condition of general cellular health throughout the body.

This effect is no doubt partly enhanced by lower blood cholesterol. This is produced by the probiotic only by consuming or destroying cholesterol in the gut. That process is most likely important in a society eating large amounts of animal derived foods. From these changes improved vitality of tissues in sites remote from the gut can be forecast. For example studies have shown lactobacilli species to benefit oral health such as reducing halitosis (Iwamoto, et al., 2010) and gingivitis (Koll-Klais, et al., 2005). Probiotics also exhibit antihypertensive potential via the improvement of lipid profiles, insulin resistance and modulation of renin (Lye, 2009) and reduce incidence of urinary tract infection through adherence in uro-epithelial cells inhibiting pathogenic growth (Zuccotti, et al., 2008).

Probably, therefore, there may be many more potential health benefits from using bowel flora that have yet to be addressed in the scientific literature. There are many suspected benefits that cannot yet be ascertained or published with confidence. The scope for future research is therefore great. Understandably the public, through their practical experience and faith in probiotics, is likely to go on using bowel flora products for a far wider range of medical conditions.

8 The Best Bowel Flora to Use for Routine Health Maintenance

As we have reviewed all the different ways in which bowel flora acts as an aid to improving health, we have focused heavily upon the Lactobacillus, especially L. acidophilus and the various species of Bifidobacterium, amongst which B. bifidum is the most widely used. This serves to give a wide review of the benefits of the probiotic approach generally. However, we now look at the practical question of creating an optimum mix of the different species of organism for use. Recognising that the different bacterial types exert the different favourable effects of bowel flora to different degrees, one naturally seeks to create a blend that will contribute towards a wide spectrum of possible health improvements.

Firstly it seems natural to provide a mix that would contain both L. acidophilus and B. bifidum. So much work has been done with these species that their role in underpinning the action of a bowel flora formula seems to be without question. Then we look at the further species that one might add so that each one might enhance one or more particular health effects. We end up with a mix that includes the following species, the additional ones being: L. rhamnosus, Lactococcus lactis, B. breve and B. longum.

This gives us the six chosen species for a fully effective mix:

- L. acidophilus
- L. rhamnosus
- Lactococcus lactis
- B. breve
- B. longum
- L. rhamnosus

The public, through their practical experience and faith in probiotics, is likely to go on using bowel flora products for a far wider range of medical conditions. If one wants to maximise a positive immune effect that leads to better resistance to bacterial infections, one might well chose to use L. rhamnosus in the presence of L. acidophilus.

L. rhamnosus was also shown to bind to aflatoxin B1 an effectively remove it from a liquid medium, presumably providing some protection against it (El Nazzal, et al., 1998). Hence if one wants an organism that contributes to detoxification of intestinal toxins one might well select L. rhamnosus.

Moreover, we have positive evidence of L. rhamnosus colonizing human colonic mucosa (Alandar, et al. 1999). Hence if one wants an organism capable of both surviving and persisting in the human gut one might well select L. rhamnosus.

L. rhamnosus is also effective to some extent against the Helicobacter pylori organism (H pylori) that infects the human gastrointestinal tract. A paper by Johnson-Henry, et al (2003) shows a potential beneficial effect against H pylori in mice by using a commercial mixture of L. acidophilus, and L. rhamnosus.

This was found to partly inhibit both colonization and mucosal inflammation in the stomach following infection with the organism. Direct extrapolation to humans is not justified and more research is needed: However, EASTERLICK, et al (2003) working with human subjects undergoing antibiotic therapy for H pylori showed that the use of the same mix of probiotic species “considerably improved the effectiveness of antibiotic therapy” (Alander, et al. 1999). Hence if one wants an additional species to see what they are L. rhamnosus and L. acidophilus might well selected for use. Recognising that the different bacterial types exert the different favourable effects of bowel flora to different degrees, one naturally seeks to create a blend that will contribute towards a wide spectrum of possible health benefits.

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Bowel Flora as Therapy Publicized

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