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The Importance of the Enzymes and Probiotic Bacteria in Belta Probiotics, and Basic Information About Using It

Belta Probiotics
1 Litre and 500 cc Bottles

Part 1
The Importance of the Enzymes and Probiotic Bacteria in Belta Probiotics

Belta Probiotics contains:
Enzymes: Protease, Lipase, and Amylase
Probiotics: Bacillus Subtillus and Lactobacillus Phantatrum

These are referred to below.

1. Enzymes and Probiotic Bacteria are Keys to Healthy Digestion

- The gastrointestinal system is a complex network of organs and glands that extract nutrients and water from food we eat so the body can use it. The food we and animals consume is processed by the gastrointestinal system in six phases:

1. **Mental Preparation**: Prepares the stomach for the meal that will be eaten.
2. **Ingestion**: Taking food into the body (eating).
3. **Peristalsis**: The movement of food through the gastrointestinal (GI) tract.
4. **Digestion**: The breakdown of food by both mechanical and chemical processes.
5. **Absorption**: The passage of digested food from the digestive tract into the vascular and lymphatic systems for distribution to the cells.
6. **Elimination**: The elimination of indigestible substances and waste products from the body.

- Digestion itself is divided into two categories: mechanical and chemical.

a) **Mechanical digestion** is physical movement that aids chemical digestion. After initial breakdown by chewing, food is churned by the smooth muscles of the stomach and the small intestine, mixing it with enzymes that start the chemical reactions.

b) **Chemical digestion** is a series of complex chemical reactions that break down large carbohydrate, lipid, and protein molecules into molecules small enough to enter the blood vessels. Chemical digestion occurs through the action of several different enzymes, such as ***amylases***, ***proteases***, and ***lipases***. For optimal digestion to occur, all these processes must work together in a delicate, synchronized balance. If any part of this complex system under-performs or over-performs, physical problems can result.

2. How important are enzymes to stomach digestion?

- Without enzymes, digestion could not take place and the food we eat could not be absorbed and utilized by our bodies. Enzymes are complex proteins produced by living cells and they start chemical reactions in the body. Enzymes are present in the digestive juices. They act upon food, breaking it down into simpler components the body can use for energy.

3. What happens if digestive enzymes do not work adequately?

- Inadequate digestion is thought to be a significant cause of food allergies. When not digested completely, food can initiate allergic reactions in the body, causing inflammation and immune sensitivity. This can lead to chronic inflammatory conditions and certain types of arthritis.

4. What enzymes are involved in the digestion process?

- Many enzymes are part of the digestion process. The three main enzymes involved in digestion are amylase, protease, and lipase. Other enzymes, such as sucrase, lactase, and maltase, have a significant secondary function in digestion.
- ***Amylase*** breaks down carbohydrates. Saliva contains amylase, which initiates the digestion of dietary starches. Pancreatic secretions also contain amylase. Amylase breaks down starch into several disaccharides (simpler molecules).
- Disaccharides, which include lactose, maltose, and sucrose, are further broken down into simple sugars by the enzymes **lactase**, **maltase**, and **sucrase** respectively. These simple sugars can then be absorbed through the small intestine to help energy production.

- **Proteases** break down protein. Protein digestion begins in the stomach with the action of the protease, pepsin. The stomach's acidic environment activates this enzyme. Pepsin is deactivated in the alkaline environment of the intestine. However, certain plant based proteases remain active even in more alkaline environments. Proteins are further broken down by pancreatic enzymes in the alkaline environment of the intestine. Most proteins are ultimately broken down into amino acids, the building blocks of life.
- **Lipases** break down fat. Fat digestion accelerates in the second part of the small intestine with the action of the pancreatic lipases. These enzymes break down fat into essential fatty acids. The lipase enzymes, along with bile salts, are responsible for the absorption of the fat-soluble vitamins: A, D, E, and K.4

5. What are Probiotic Bacteria?

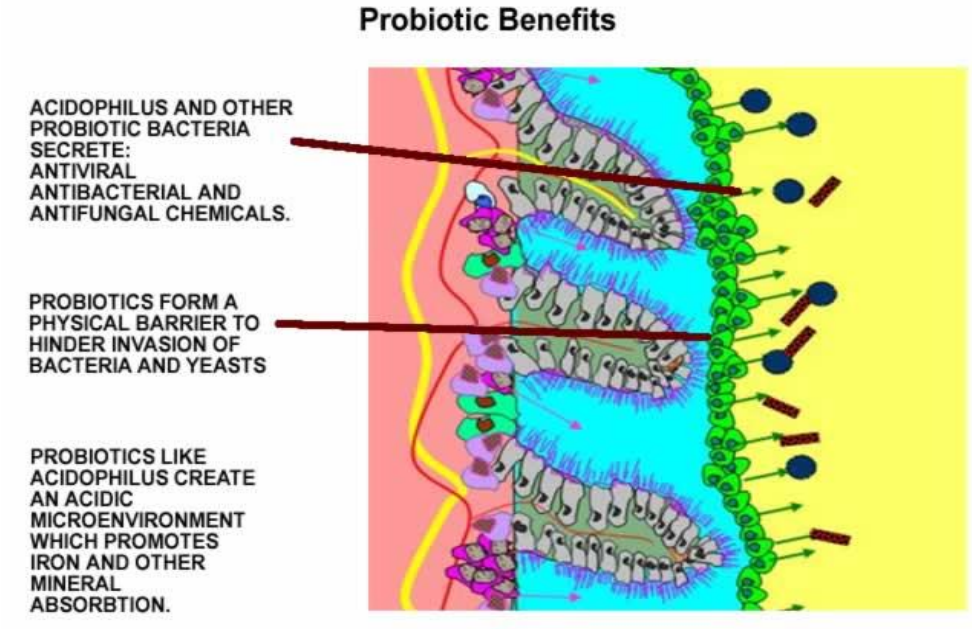
- Probiotic bacteria are beneficial nontoxic live bacteria that are necessary for life and do not cause disease (non-pathogenic). The probiotic bacteria most commonly studied include members of the Lactobacillus and Bifidobacterium group. Because of the Lactobacillus and Bifidobacterium's ability to break down lactose, these probiotic bacteria are also known as lactic acid bacteria. Both probiotic bacteria are well-studied and are available in foods and dietary supplements.

6. How do Probiotic Bacteria work?

- By attaching themselves to the intestinal wall, friendly bacteria keep pathogenic bacteria from gaining a foothold. In addition, they produce lactic acid and hydrogen peroxide, (which kill most disease-causing bacteria). Some yogurts and other fermented food have these cultures, but these may not be strong enough for today's environment. This is why probiotic supplementation is so important

7. Benefits of Probiotic Bacteria

- In sufficient numbers, these friendly bacteria keep disease-causing bacteria from overpopulating the intestine. Also, they improve digestion, manufacture B vitamins, and boost immune system activity. Because they boost immunity, they positively influence the overall health of the animal.
- Animals get sick when their gastrointestinal tract becomes disrupted. Beneficial (friendly) Micro-organisms can no longer flourish in needed numbers and in the proper balance. What is the cause of this disruption in the gastrointestinal tract? Past and present use of antibiotics contributes heavily to the problem.



The diagram illustrates the probiotic layer (green) living on the surface of a layer of mucus (turquoise). The arrows indicate their ability to repel yeasts, bacteria and fungi.

- Perhaps you are not giving your animals antibiotics, but unless you are taking almost superhuman precautions with the food and water, they are still eating antibiotics on a regular basis. Every time your animals drink chlorinated water, eat antibiotic-laden foods, or take prescription antibiotics to fight infection, you are killing the friendly bacteria as well as the bad. And, if that is not bad enough, stress and excessive sugar consumption interfere with the good bacteria in the system.

8. Is there a difference between the probiotic bacteria found in yogurt, and in nutritional supplements?

- Actually, the bacteria in yogurt, our intestine, and most natural supplements are the same types of probiotic bacteria, Lactobacillus acidophilus and Bifidobacterialongum. Because of this, these bacteria are referred in a generic sense as Probiotics. So, the term Probiotics may refer to the "good" bacteria that are present in food, or that live in our intestine, or that are part of a natural supplement.

9. Where do these probiotic bacteria come from?

- As recently as the middle of the last century, bacteria found naturally in food ingredients were used to make a fermented food product. For example, the lactic acid bacteria found naturally in milk were used to make cheese. This was known as wild fermentation.
- Wild fermentations are no longer used. Today, the probiotic bacteria used in food and natural supplements are harvested via a highly controlled fermentation process. This process results in high numbers of bacteria and ensures quality and purity of the bacteria.

10. Why are probiotic bacteria important for digestive health?

- Normal microflora (the term commonly used for intestinal bacteria) is associated with good health. An imbalance in this natural microflora (when the beneficial probiotic bacteria are outnumbered by the harmful bacteria) is frequently associated with various disease states such as yeast infections and colon cancer. Eating foods or taking a nutritional supplement containing probiotic bacteria can help support and modify the composition of the large intestine microflora. Microflora of the large intestine assist digestion through fermentation (by making the intestines more inhospitable to invading bacteria species), protection against disease-causing bacteria, and stimulation of the immune system. The probiotic bacteria, Lactobacillus and Bifidobacteria, occupy a central role in the intestinal flora and provide health benefits.

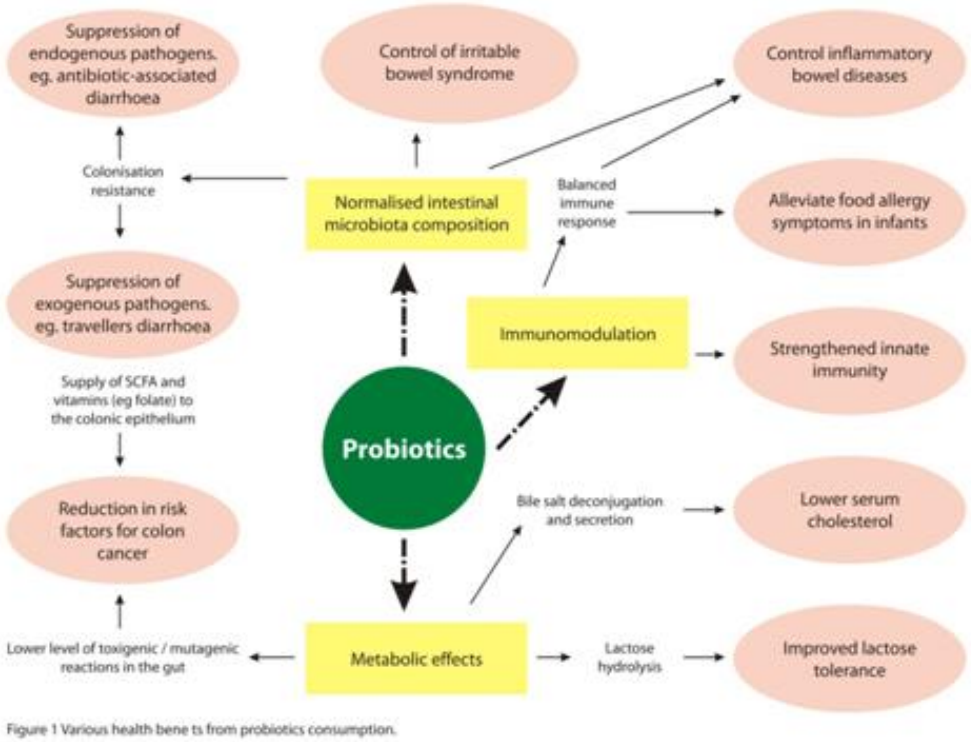


Figure 1 Various health bene ts from probiotics consumption.

11. What is the difference between digestive enzymes and probiotic bacteria? Can they be taken together?

- Digestive enzymes, such as protease, amylase, and lipase, act upon food, breaking it down into simpler components that can be used by the body for energy. Without enzymes, digestion could not taken place. Therefore, the food that we eat could not be absorbed and utilized by our bodies. Probiotic bacteria help the enzymes to digest food and process waste. In essence, probiotic bacteria and enzymes work together to ensure that the digestive tract is running smoothly. When taken together, enzymes assure greater levels of digestion and absorption of your food, and probiotic bacteria aid the enzymes in digestion and keep problems in check.

12. Why are probiotic bacteria important for digestive health?

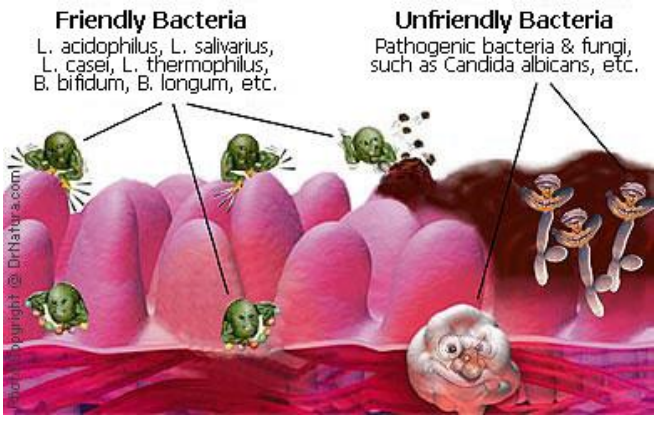
- Colonies of bacteria in the intestine are called "microflora". While a normal microflora is associated with good health, changes in intestinal health are associated with weakened immune function. An imbalance in the natural microflora is frequently associated with various disease states such as yeast infections and colon cancer.
- Oral ingestion of Belta Probiotics bacteria helps support and modify the composition and metabolic activities of the large intestine microflora. Microflora of the large intestine assist digestion through fermentation (lowering the pH of the intestine, making it more acidic and inhospitable to invading species); protect against disease-causing bacteria; and stimulate the development of certain immune system components. Lactic acid bacteria have a central role in the gut flora enabling them to influence the composition of the flora for health benefits.
- Belta Probiotics bacteria need to be ingested regularly for their health-promoting effects to persist.
- Belta Probiotics bacteria also have been demonstrated to have anti-cancer properties.
- Lactose is an important sugar that is converted to lactic acid by lactic acid bacteria. Lactose intolerance results from an inability to digest lactose, due to the failure of small intestine mucosal cells to produce lactase, an enzyme needed to digest lactose. Lactase deficiency causes people and animals to accumulate non-absorbed lactose in the gastrointestinal tract, which draws water and electrolytes into the gut and accelerates transit time, leading to bloating, cramping, diarrhoea, and malabsorption of nutrients. Lactic acid bacteria have been shown to support the breakdown of lactose, specifically by enhancing the activity of lactase (beta galactosidase), which improves lactose digestion and tolerance.

13. How often should Belta Probiotics be taken to ensure optimal support of the digestion system?

- Although Belta Probiotics bacteria may survive passage through the stomach, they do not permanently colonize in the body and need to be replenished. Therefore, they need to be ingested regularly for their health-promoting effects to persist.

14. Conclusion

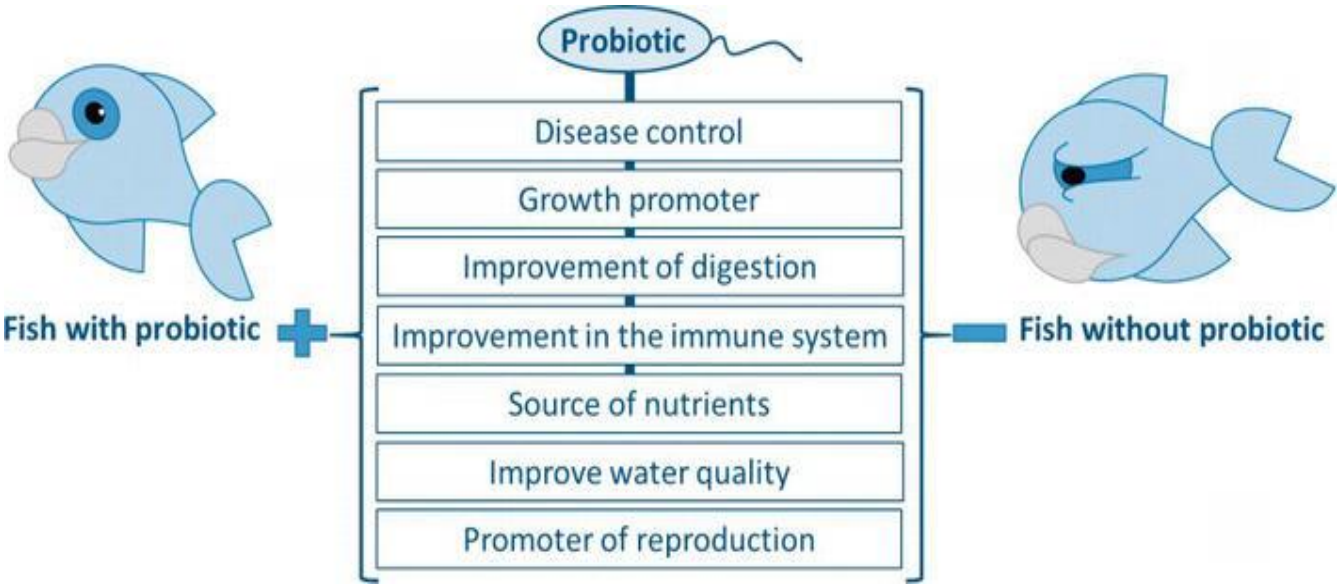
- The body is dependent upon nutrition. Every building block, every bone cell, even the sheen of the hair and skin, is the result of the food we eat. But what good does it do to select high quality food if its nutrients are not fully absorbed?
- Enzymes that assure greater levels of digestion and absorption of your food, and Belta Probiotics bacteria that keep problems in check, can make a huge difference in one's own health and in that of animals.



Part 2
Basic Information About Using Belta Probiotics

1. Benefits

- Belta Probiotics is a high quality probiotic product that improves the digestion of livestock and poultry, such as cows, buffalos, chickens, sheep, and pigs, so that they absorb more protein, minerals, etc. Their weight increases noticeably more quickly than in animals not taking Belta Probiotics.
- They become healthier and their immune system is strengthened so that they are much less liable to fall ill. The animals do not have to take medicine during the period the farmer is using Belta Probiotics. The farmer could test this by keeping aside some animals that are not given medicine.
- If a herd or group of animals is ill, such as they have flu, Belta will not cure them of their illness. It is not a medicine. But it will help them to become stronger again because it will improve their digestion of proteins and minerals (and also of the medicine, if this has been mixed into their food). It will help their immune system to become stronger again. Belta is useful in that it also helps to prevent the animals from getting ill in the first place.
- **Fish Farming Benefits:**



2. How to Use It

- Belta Probiotics is a liquid. When mixing it with animal feed the easiest way is to pour out the animal feed onto a plastic sheet, spread it out thinly, spray Belta over the animal feed, and then mix it altogether with a spade or rake. If you cannot spray it, then pour it thinly over the animal feed that has been spread out already, and then mix it altogether.

Method 1 - Mix it with Animal Feed

- Mix 5 cc with 1 kg of animal feed.
- Mix 1 litre with about 300 kgs of animal feed.

Method 2 – Mix it with Drinking Water for the Animals

- Mix 100 cc with 100 litres of water.

3. Amount Needed for Animals the Size of Sheep, Cows, or Pigs

- Each animal will need 1 x 500 cc bottle for its life (about 6 months).
- For example, 70,000 animals = 70,000 x 500 cc bottles. Or 35,000 x 1 litre bottles.

- 70,000 bottles = 3.5 x 20-foot containers.
- 500 cc Size: 1 container holds 1,000 cases x 20 cc bottles = 20,000 bottles.
  1 litre Size: 1 container holds 612 cases x 20 bottles = 12,240 bottles.

4. Questions Commonly Asked

4.1 If Belta is used by mixing it in water, how long can we keep that water in the open air?

- The farmer must use the water the same day.

4.2 Will the microbial activity in Belta start when we put it in the water or will it start in the stomach of the animal?

- When Belta is mixed with water, the microbial activity will start to work at once.

4.3 Can we mix Belta in water and then spray it on the feed?

- Yes. The farmer can mix Belta with animal feed in the same dosage of water quantity. For example, if you wish to mix 1 litre of Belta with the animal feed, then mix the litre with 1 litre of water before applying it.

4.4 When can I start using Belta with animals?

- You can start to mix it with water or animal feed from when the animal is a baby.

4.5 Can I apply Belta directly into the mouth without water? If so, how much?

- In the event that there is no controlled farming and the cows graze in the open, you can apply Belta directly into the mouth of the animal mixed with or without water.
- If there is no water trough, the farmer should put 10 cc of Belta straight into the mouth, with or without any water. This applies to large animals, such as cows and buffalos.
- Apply this amount at each feeding time.
- In the case of smaller animals, such as goat and sheep, a farmer should put 5 cc (one teaspoon) of Belta straight into the mouth, with or without water.

4.6 How long will it take to get the results from the animal using Belta?

- The results will start to appear as the digestion process improves, which will be quick. We cannot say exactly how long it will take, but the effects will soon appear in a higher milk yield. We can only assure you that the difference will be seen.

4.7 Type of Feed: a) Fibre Feed b) Concentrated Feed

What kind of feed do you think Belta will work better with?

It does not matter which kind the farmer uses with Belta. Belta is going to improve the digestion and absorption of minerals, protein, etc., and this will increase the rate of growth of the animals.

4.8 What will be the increase in the growth and weight of the animal, and in the milk yield?

- Farmers often get 15% increase in weight. Belta Probiotics will increase the food intake and the amount digested. We can only say that the volume of milk will increase, but we cannot say how much. It varies between 5% and 20%. The increase will only take a few days to appear. Belta will give the carcass a higher grade. The probiotic bacteria divert hydrogen metabolism from methane production (which is wasteful of carbon) to acetogens (production of acetate), which results in reduced methane emissions and an increased transfer of carbon from the animal's feed into its growth.

4.9 Why are there much fewer flies that attack animals using Belta?

- It is caused by a change in the smell of the cows that results from the cows becoming healthier. Belta improves the immune system and health of the cows. Also the fecies smells a lot less.
- The probiotic bacteria inhibit harmful intestinal bacteria, primarily in the hindgut, which make the fecies smell. The probiotic bacteria renders the intestinal environment less favourable for the growth of coliforms. As a result, the cows create much less of a smell, just like a person who is healthy does not give off a smell.

4.10 What are the kinds of test results that farmers get with Belta?

- In short, usually the weight increases about 15%; the animals are healthier and do not seem to fall ill, which reduces medical bills; the milk yield increases; their fecies are not smelly; the cows do not seem to give off a smell that attracts insects; and the carcass gets a higher grade. As a result, the farmer's costs drop and revenue increases. The percentage increases depend on how long the cows have been using Belta. The benefits become more noticeable the longer the animals use Belta.

4.11 How much will the increase in growth rate be?

- We do not want to over-claim. We have received different results from people trying out Belta with cows, pigs, and chickens ranging from 15% - 25%. Possibly some people are not using Belta as well as they could. The minimum should be 15% - 20%.

4.12 How can I use Belta with crabs in a pond?

- The basic guidelines below apply. If the ponds are reasonably small you might also like to mix Belta with the pond water for extra effect regarding the growth rate and keeping the crabs free of disease.

Method 1 - Mix it with the Feed

- Mix 5 cc with 1 kg of feed.
- Mix 1 litre with about 300 kgs of feed.

Method 2 – Mix it with the Pond Water

- Mix 5 cc – 10 cc with 100 litres of water.
- You can start to mix it with water or animal feed from when the crabs are very small.

Part 3
Material Safety Data Sheet for Belta Probiotics

1. Chemical Product and Company Identification

PRODUCT NAME:	Belta Probiotics.
PRODUCT DESCRIPTION:	Liquid, chemical-free, probiotic, food supplement.
MANUFACTURER:	Artemis & Angel Ltd., 99/296 President Park, Sukhumvit 24, Klongtoey, Klongtoey, Bangkok 10110, Thailand Tel.: +66-99-3377866 (English); +66-86-329-6038 (Thai)

2. Composition / Information on Ingredients

INGREDIENTS APPROX. % BY WT:	This cannot be calculated.
COMPONENTS:	Mixed culture of microbes and enzymes.

3. Hazards Identification

PHYSICAL APPEARANCE:	Brown liquid.
IMMEDIATE CONCERNS:	There are no specific hazards known to be associated with this product although precautions should be taken to avoid unnecessary contact with eyes and mouth.

4. First Aid Measures

EYES:	Irrigate thoroughly with water for at least 10 minutes. If any discomfort persists, obtain medical attention.
SKIN:	No need for concern or medical attention. Just wash skin with water and soap.
INGESTION:	Wash out mouth thoroughly with water. Obtain medical attention because the fungi would be in too high a concentration for the stomach.
INHALATION:	No concern.

5. Fire Fighting Measures

GENERAL HAZARD:	No hazard.
EXTINGUISHING MEDIA:	We do not know how you could set it alight as it does not contain any chemicals. If you manage to set it alight, use either water spray, foam, dry chemical, or carbon dioxide.

6. Accidental Release Measures

SMALL SPILL:	No hazard. No need for appropriate protective clothing. Flush spillage down a drain or deposit it onto soil. There are no chemicals in it.
LARGE SPILL:	No hazard. It can be disposed of on the nearest soil or down a drain. If it enters a waterway, there is no need for concern.

7. Handling And Storage

HANDLING:	No protective clothing is needed. You can handle it with your bare hands with no negative effect.
STORAGE:	Store in a cool, shaded, dry place in original container. You can leave it exposed to the air without any concern.

8. Exposure Controls/Personal Protection

EYES AND FACE:	No need for appropriate clothing and eye protection.
RESPIRATORY:	No need for appropriate clothing and eye protection.
PROTECTIVE CLOTHING:	No special clothing is needed.
WORK HYGIENIC PRACTICES:	If it gets onto your hands or skin, wash your hands or skin in case your hands touch your eyes later on.

9. Physical and Chemical Properties

PHYSICAL STATE:	Liquid
ODOR:	Non-pungent
APPEARANCE:	Liquid
COLOR:	Brown
PH:	5.6
BOILING POINT:	About 100 degrees Celcius
FREEZING POINT:	About 0 degrees Celcius
MELTING POINT:	Not relevant
SOLUBILITY:	Liquid

10. Stability And Reactivity

STABLE:	Yes
HAZARDOUS POLYMERIZATION:	No
HAZARDOUS DECOMPOSITION PRODUCTS:	None

11. Toxicological Information

TARGET ORGANS:	There are no toxins or pathogens. No target organs.
CARCINOGENICITY:	None.
IARC:	None of the materials used in this product contain chemicals on the IARC list.
NTP:	None of the materials used in this product contain chemicals on the NTP list as there are no chemicals in it.
GENERAL COMMENTS:	The product has no carcinogenic properties or mutagenic or teratogenic effects. It is 100% bio-organic and chemical-free.

12. Ecological Information

GENERAL COMMENTS:	Belta Probiotics is chemical-free. You can pour it onto the soil and it will cause no harm at all. If it enters a waterway, it will not cause. There is no concern for the environment.

13. Disposal Considerations

DISPOSAL METHOD:	Throw it onto soil or pour it down a drain. Or give it to animals to consume in their food. There are no chemical residues.

14. Transportation Information

SPECIAL SHIPPING NOTES:	This product is not regulated under national or international transport regulations.

15. Regulatory Information

GENERAL COMMENTS: This product is not regulated by any known government agency as hazardous.

16. Other Information

MANUFACTURE DISCLAIMER: The information supplied on this sheet is to the best of our knowledge accurate at the time of preparation. It does not relieve the user of this product of any responsibility to comply with local, national, or international laws relating to the handling or use of this product. The supplier does not accept responsibility for any claims resulting from the misuse of this product or failure to comply with the information stated within.

Yours faithfully,

Somkiet Panjanapongchai
President
Artemis & Angel Co. Ltd.

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Certificate of Analysis of Belta Probiotics

Name: Belta Probiotics

Type of Product: Probiotics

Total Plate Count: 5.5×10^8 CFU/ml.

Method of Analysis: Total plated count of microorganisms by pour plate and spread plate.

Components of Belta Probiotics *(Minimum amounts)*:

Microorganisms:

- Bacillus Subtillis 2.8×10^8 CFU/ml
- Lactobacilus Phantatrum 2.7×10^8 CFU/ml
- Protease 250,000 IU
- Lipase 70,000 IU
- Amylase 1,100,000 IU

Note: Belta Probiotics is 100% organic, microbial product, and it is guaranteed to be free of chemicals, toxins, and pathogens.

Yours faithfully,

Somkiet Panjanapongchai
President
Artemis & Angel Co. Ltd.