LECTURE 12: INTRODUCTION OF FOOD MICROBIOLOGY

• Food supply consists basically of plants and animals or product derived from them, it is understandable that our food supply can contain microorganism in interaction with food.

• These microorganisms use food supply as a source of nutrients for their own growth. These will cause two possibilities: Either – Result in deterioration of food ("spoil") OR These interactions between microorganisms and food give beneficial to human.

1. How microorganisms can cause deterioration of the food?

• When they utilize the nutrients of the food, it involved changes in the food compound like synthesis a new compound that cause spoiling of the food or produced enzymatic changes and contributing off-flavours by mean of breakdown of product.

How to prevent deterioration of the food by microorganisms?

• Minimize the contact between microorganisms and food
• Eliminate microorganisms from foods
• Understand about preservation of the foodWhat are the importance of microorganisms in food? Good (desirable) Bad (undesirable)
• Food bioprocessing • Foodborne disease
• Food biopreservation
• Food spoilage
• Probiotics

GOOD (DESIRABLE) Food bioprocessing

• Foods produce by using biological process. In this process, food-grade microorganisms are used to produce different types of fermented food using raw materials from animal and plant sources (this process known as "starter culture").

• Besides, microbial enzymes are also being used to produce food and food additives. Food biopreservation

• Is a food biological preservative by using antimicrobial metabolites (taken from certain microorganisms in order to control pathogenic and spoilage microorganisms in foods).

Probiotics

• Is a concentrated supplement of beneficial live cells of bacteria (friendly bacteria) culture taken orally intended to improve our health by promoting our body's natural immunity and improving digestion system. BAD (UNDESIRABLE) Foodborne disease.

• Is a disease cause by consumption of contaminate during various stage of handling between production and consumption by many pathogenic microorganisms (bacteria, molds and viruses). Food spoilage.

• Is a condition of contaminate food due to: Growth of microorganisms in food OR The action of microbial heat stable enzymes
• Microorganisms used food supply as a source of nutrients by their own growth.

Spoilage leads to wastage of food and economic loss.

PROBIOTICS

Definition: Probiotic is concentrated supplements of beneficial live bacteriaculture taken orally intended to improve our health. It is a friendly bacteria which play vital role in keeping us fit and healthy. Probiotics means "for life". The good friendly bacteria are good because they promote thebody's natural to keep our body fit and to help our digestion.

Advantages

1. By increasing the absorption of mineral and vitamins and it also can improve digestion system especially of milk product. In our food, only vitamins that properly absorbed and digested are useful. Probiotics also improve lactose intolerance.
2. Taking probiotics can support out immune system which is fight bad bacteria and infection in keeping s cope from being run down. It produced antimicrobial substances that can deter various bad bacteria. It is so important because many of the disease begin in the intestinal tract.
3. Produced specific protein that acts as antigen and stimulates the immune system.
4. Increase the absorption of calcium, important mineral in the prevention of osteoporosis.
5. Preventing intestinal tract infections that are cause by Candida spp. and Helicobacter pylori. 6. Normalising bowel elimination problems and promoting regularity.
7. Clean the colon and improve constipation.
8. Fights pathologicals moulds, yeast, fungal, viruses, parasites and bacteria.
9. Stimulates β—lymphoctes and related antibody production.
10. Supporting healthy liver function.
11. Alleviating bloating
12. Assisting in cholesterol management. The example of probiotics in foodMilk- baby milk nowadays is added with Lactobacillus acidophilusand Bifidus bacteria.Yogurt- rich with live bacteria culture such as Lactobacillusbulgaricus and Streptococcus thermophillus.Cheese- friendly bacteria that is added in cheese is Lactobacillus.Buttermilk- Lactobacillus bulgaris

Side effect of probiotics to human

Even though probiotic are beneficial bacteria, sometimes it cancause indirect or long term side effect especially if taken inappropriately. Factors that can produce side effect:

a) Probiotics supplement in food are not safe or not working inside the body.
b) Product that has been taken (food) did not deliver probiotics to specific area to perform its function.
c) Not all probiotics product in market today are created sufficiently enough for body necessity. Some of them are over concentrated and some are less than minimal requirement.

Side effect that occurs include:

a) Excessive drainage syndromes.
b) Headache.
c) Diarrhea.
d) Bloating.
e) Constipation.
f) Production of intestinal gas.

Bacteria in the intestine The variable and greatest number of bacteria lives in large intestine. Lactobacillus acidophilus guard small intestine. Bifidobacter protect large intestine. Lactobacillus bulgarium is a travelling transient bacteria that aidsthe two it bases through our body.