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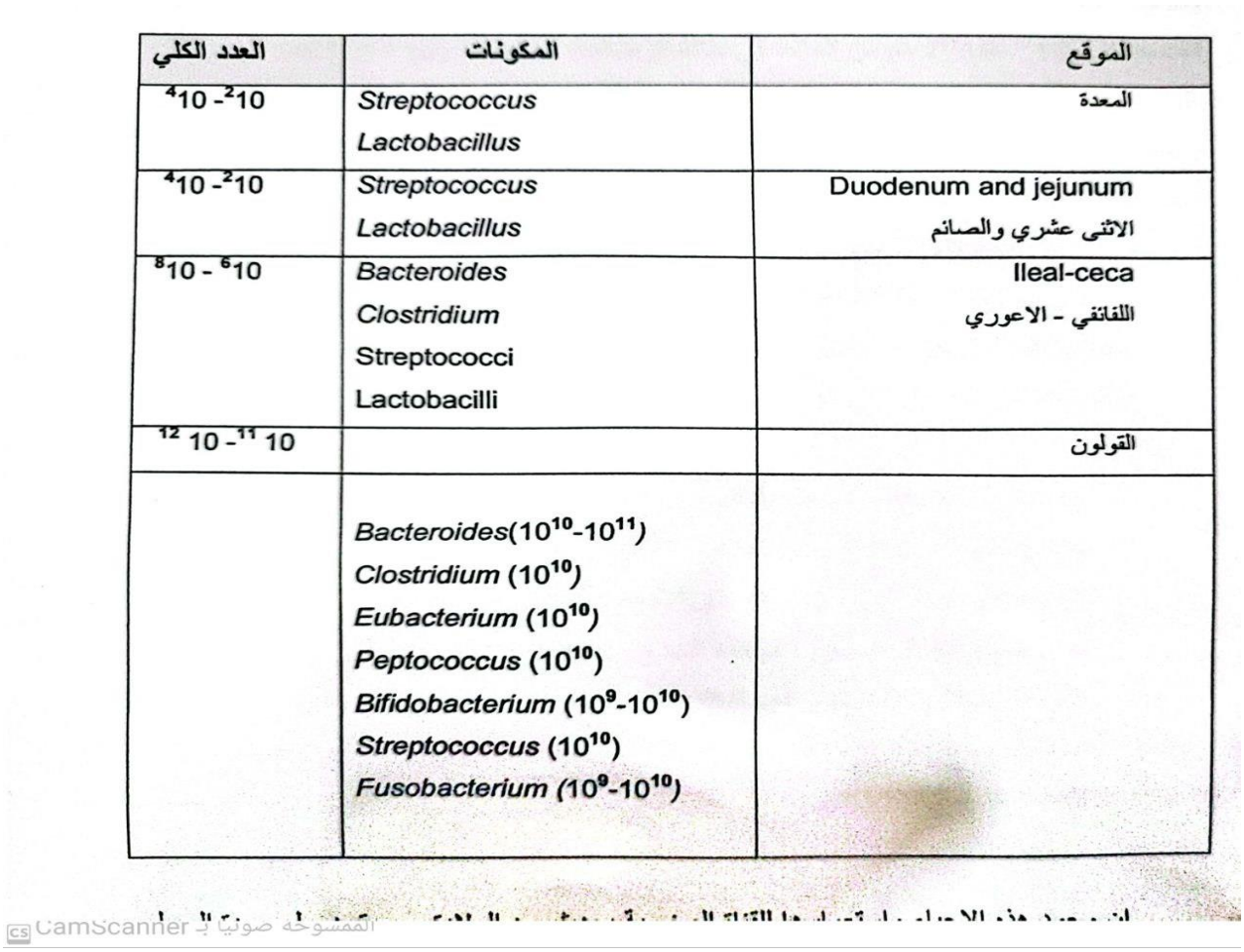
Normal flora

- The word Microflora refers to the collection of live microscopic organism that flourish inside the organs of living creatures. They act as protective agent that strengthen the immune system or destructive agent that weaken the body.
- proximately 500 different bacterial species have been identified up to date in the digestive tract. A healthy normal microflora is the first line of defense to invading and thus it is extremely important for the ability to fight off infections with enteric pathogens.
- The human body contains many microscopic organisms that are in a state of balance with each other. When this balance relationship changes, diseases resulting from bacterial infection appear. In addition, physiological diseases appear from a change in the body's physiological balance or when the immune system is disturbed.
- Microorganisms inhabit the human or animal body in several locations in the body and are in a state of coexistence with them in normal cases. These areas include the skin and the mucous membranes that cover the nasal cavities and the oral cavities, in addition to their colonization of the digestive tract, especially the lower part of it, and the urogenital tract.
- The intestines, especially the large intestine, represent a complex ecosystem in which organisms are metabolically active. Organisms are located close to the mucous layer or the epithelial mucous layer in the intestines. These organisms interact with the materials that reach them from the intestines, as shown in the table 1.

Table 1;- Bacteria found In Human GIT



الموقع	المكونات	العدد الكلي
المعدة	*Streptococcus* *Lactobacillus*	10^{2} - 10^{4}
Duodenum and jejunum الاثنى عشري والصائم	*Streptococcus* *Lactobacillus*	10^{2} - 10^{4}
Ileal-ceca اللفائفي - الاعوري	*Bacteroides* *Clostridium* Streptococci Lactobacilli	10^{6} - 10^{8}
القولون		10^{11} - 10^{12}
	Bacteroides(10^{10}-10^{11}) *Clostridium* (10^{10}) *Eubacterium* (10^{10}) *Peptococcus* (10^{10}) *Bifidobacterium* (10^{9}-10^{10}) *Streptococcus* (10^{10}) *Fusobacterium* (10^{9}-10^{10})	

- In the absence of resident microorganisms in the alimentary tract, overgrowth of the pathogenic yeast Candida albicans can occur leading to tissue invasion.

Microflora of Skin

The skin is home to a wide variety of microorganisms, most of which are benign or even helpful to the host. It is most likely to carry transitory flora due to its frequent exposure to the environment. However, there is a consistent and distinct resident flora that is altered in various anatomical regions by secretions or exposure to mucosal membranes. Such microflora of human skin are:

Staphylococcus aureus
Staphylococcus epidermidis
Corynebacterium spp
Propionibacterium spp
Micrococcus spp

Microflora of Upper Respiratory Tract and Buccal Cavity

In the mouth, yeast (*Candida* species) is present. Even in teeth, several anaerobes such as *Provotella spp, Fusobacterium spp, Lactobacilli* and several anaerobic vibrios are seen.

Significant *Staphylococci* such as *S.epidermidis* and *S.aureus*, *Corynebacteria* and *Streptococci* make up the nose's flora..

Other predominant microbes in the upper respiratory tract are *Neisseriae*, mycoplasmas, pneumococci and diphtheroids.

Benefit of Microflora ,,

First, it is a source of some nutrients, as many of them produce thiamine, riboflavin, folic acid, phenytoinic acid and other vitamins, in addition to producing short-chain fatty acids that stimulate intestinal movement.

Second, the physiological effect. In this case, natural flora affects the external appearance of the intestinal mucosa, as well as affects the differentiation of epithelial cells and leads to an increase in some enzymes such as pep and enzymes that decompose disaccharides.

Third, natural organisms play an important role in influencing the immune system, as in their effect on the maturation of cells in Peyer's pockets, as while the flora provides a continuous and repeated supply of antigens, which leads to making the immune system active throughout human life.

Fourth, the effect on tumors, as it is known that 90% of carcinogens in humans are caused by the environment, the most important of which is food, as it helps reduce the risk of developing from its development plans.

Fifth, the effect on external injuries Especially the intestinal tract, as it represents one of the body's first lines of defense against external pathogenic organisms.

Factor affected on Gut Microflora,

all though the composition of the gut Microflora is fairly constant and characteristic for each host species it can be affected by various factors.

1. **Age:** the microflora of live young suckling mammal is different from that on adult.
2. **Diet:** to some extent this will be responsible for changes seen with age, but even between adults. The composition of the diet can affect the composition of the gut microflora.

3. **Medication;** the use of the antibiotic and other chemical antibacterial compounds either as growth promoters or therapeutic agent can changes gut Microflora in such a way as to allow the growth of pathogens.

Probiotics

- Probiotics are group of live microbes defined by (FAO/WHO, 2001) as live microorganism when administrated in sufficient quantity can confer the health benefit.
- Probiotics as viable bacteria (belonging to the natural non-pathogenic bacterial flora) which produce beneficial affect promoting the equilibrium of intestinal flora.
- Common descriptive for Probiotics include good, friendly, beneficial, healthy bacteria, safe food, therapeutic food and pharm food.

☒ **In conclusion,** the Probiotic is an umbrella term given to any live microorganism that beneficial to its host.

Characteristic of Probiotics

From safety point of the view, the Probiotic microorganisms should have certain characters,

1. Exert a beneficial effect of the host
2. Be nonpathogenic and nontoxic.
3. Contain large number of viable cell.
4. Remain viable during storage and use.
5. No ability to transfer antibiotic resistance genes and be able to maintain genetic stability.
6. Acid and bile-stability, resistance to digesting enzymes.)
7. Must be safe for its intended.
8. Capable of survival, proliferation and metabolite activity at the target site.
9. Potentially resistance to bacterioins and other antimicrobial produced by residing microflora
10. Immune stimulatory, by improve immune system of body host by increase the production of antibody and increase the effective immuno-cell like phagocytosis.

Probiotic Microorganisms

- Probiotic bacteria with documented health benefit include number of the Lactobacillus and Bifidobacteria genera, although strains of Enterococcus, Propionibacterium and the last, Saccharomyces,

Microorganisms considered as Probiotics

Lactobacillus species	Bifid bacterium species	Other lactic acid bacteria	Non-lactic acid bacteria
L. acidophilus	B. dolescentis	Enterococcus faecalis	Bacillus cereus ('toyoi')[1,2]
L. casei	B. animalis	Enterococcus faecium	Escherichia coli ('Nissle 1917')
L. crispatus	B. bifidum	Lactococcuslactis[3]	Propionibacterium freitden-reichii[2]
L. gallinarum[1]	B. breve	Leuconostocmesenteroides[3]	Saccharomyces boulardii[2]
L. delbruecikii	B. infantis	Pediococcusacidtfactici[3]	
L. gasseri	B. lactis[4]	Sporolactobacittusinulimis[1]	
L. johnsonii	B. longum	Streptococcus thermophilus	
(L. paracasei)			
L. plantarum			
L. reuteri			
L. rhamnosus rhamninfius			

Mechanism of action of probiotics

The most important advantage of probiotics over antibiotics is that the former is free of any residues in the meat and milk of farm animals which might have serious health implications for consumers.

1. By Producing or Secreting the Antibacterial Compound
   The *Lactobacillus acidophilus* has be reported to produce acidophilin, acidolin and lactocidin , lactolin B, lactocin F, and also produce nicin and reuterin.
2. Competition on Nutrient Sources
3. Competition to the Adhesion sites
4. Stimulation of Immune System of Host