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Review Article

A Brief Review of the Evolutionary Thought and Etiology of the Stomach Disorders with Prevention

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ABSTRACT

The stomach of animals plays a significant role throughout life. After taking food, the nutrients of those foods maintain all biological processes. The stomach is a reservoir for storing food for several hours. If digestion within the stomach hampers, the entire body will undergo many ailments. Evolutionary changes in the stomach of various animals (herbivores, carnivores, and omnivores) to understand the quality or nature of the stomach based on their food. Based on some articles, oral communication, and an effective questionnaire proved that in a northern region of Bangladesh (Saidpur town under Nilphamari District), out of 60 families, 85% of family members were affected by acidity problems where 37% of college students (17-19 years) due to their excess taking of oily and spicy foods. On the other hand, their regular food intake showed 80% acidic, 7.5% neutral, and 12.5% alkaline food.

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INTRODUCTION

The research found that gastric acid has evolved approximately 350 million years ago. The role of the stomach has an important barrier against pathogen entry into the gastrointestinal tract [1, 2]. The inhabitants of Denmark submit a fat tax for reducing the burden of cardiovascular diseases. In the United States, they consume the highest fast food in the world whereas Spain the lowest. Stomach acidity decreases with age and in some medical treatments [3, 4, 5]. In mammals, gastric acid produces in the stomach but in birds' acid produces in the proventriculus, and food is stored in the gizzard. Premature infants have a less acidic stomach (pH>4) and are susceptible to enteric infections [6]. Similarly, elder people show relatively low stomach acidity [7]. Domestic animals have very highly acidic stomachs like humans. Diet and ingredients have direct and indirect effects on the body's intracellular and extracellular compartments, especially blood and urine, still, they do not influence the pH level significantly [8]. Fatty acids have low solubility in blood, so they do not have any influence on the pH of the blood. Hydrochloric acid is formed as a product of the breakdown of cationic amino acids (arginine, lysine, histidine). The degradation of proteins has no significant acidifying or alkalinizing effect [9]. A high uric acid level cannot be linked to the development of arthritis or other metabolic diseases [10]. Lungs and kidneys have the most important role in sustaining the acid-base balance [10]. A persistent and severe acid-base imbalance cannot be controlled via diet [11, 12]. The alkaline salts and chlorophyll contents, though their effect on the human body has not been proven by scientific evidence [13]. High fibre content can lead to bloating amongst people being sensitive to them. Vegetables with higher carbohydrates (eg. potato) are considered a so-called alkaline diet [14], Their increased consumption can have negative effects but in a balanced diet, they do have a role [15, 16]. Lemon, lime, and grapefruit are highly recommended without any justification. This dietary restriction can result in cardiovascular diseases, tumour, diabetes, etc. [17, 18, 19]. Alkaline diets and supplements have not shown benefits to bone health [15]. The allowance of fish consumption is positive based on the nutritional fact, because of their eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and beneficial fatty acid (omega-3). Despite this fish support, marine molluscs, mussels, and algae are not allowed [20, 21]. Animal fats have high cardiovascular risk but as part of a balanced, enjoyable, and tasty diet, they can be used in an appropriate amount [22]. The objective of this study is to understand the pH value of our daily foods for protecting ourselves from all sorts of acidity-related problems.

Types of Acidity Problems and Ulcers

Gastric acid secretion not only initiates the digestive process but also acts as a first line of defense against food-borne microbes [23]. When we eat food with adequate air then excess gas will come out from the stomach by mouth which is called belching. The gas of the gut that comes out from the anus is flatulence. When hydrochloric acid comes out from the stomach to oesophagus then acid reflux happens and is symptomized into heartburn (sometimes for stomach ulcer) and its repetition and overtime stability can cause

gastroesophageal reflux disease (GERD). Gaseous cramps could be happened due to trapped gases within the body. Lactose intolerance does not directly link with heartburn or acid reflux. Due to food intolerance and constipation, bloating may happen where lots of gases are in the gut. *Helicobacter pylori*-induced gastritis and its associated diseases including peptic ulcers and gastric cancer are addressed together with advances in diagnosis [23].

P^H Level Based On Food Habit Of Animals

An herbivorous stomach has an alkaline chamber that houses microbes for fermenting a plant diet [24, 25, 26, 27, 28]. Rabbits are known to engage in frequent coprophagy allowing re-inoculate with microbes [29]. Scavengers and carnivores have the higher acidic stomach to sustain high pathogen loads from dead hosts. Insectivorous birds eat insects with their chitin, so acidity plays a significant role. Omnivorous and piscivorous were the most variable in stomach acidities. Their diets differ from species to species. Platypus has no stomach, and food direct goes to the intestines.

Types Of Stomach, Functions, And Their Cellular Secretion

Human blood plasma and pancreatic juice are alkaline in nature (7.35-7.45 and 8.4-8.9 pH value), and gastric juice is 1-5, so this is acidic. In humans, the monogastric stomach (single-chambered) is composed of fundic, cardiac, body, and pyloric portions. On the contrary, bovine animals have a complex stomach (four-chambered) [30]. Rumen is responsible for fermenting food and produces fatty acids and vitamins. Reticulum collects smaller food particles. Omasum plays the absorption of water, electrolytes, fatty acid, minerals, and fermentation of food. Finally, abomasum produces hydrochloric acid and pepsin for the proper digestion of foods. In the stomach, peptic cells are responsible for secreting pepsinogen enzyme, neck cells secrete mucous, and parietal cells secrete hydrochloric acid. In the case of titratable acidity, the amount of hydrogen ion excreted in the urine in a dihydrogen form. In humans, upright acid reflux happens throughout the day, whereas supine acid reflux causes at night time.

Acidic food (pH: 0-6.9) (80%)	Neutral food (pH: 7) (7.5%)	Alkaline food (pH: 7.1-14) (12.5%)
lemon juice, coconut juice, honey, tomato, carrot, cucumber, lentil pulse, apple juice, papaw, soyabean oil, barn oil, coffee, black/green tea, pineapple, melon, green pepper, cashew nut, burger, dried fish (sundried), beef, chicken, *Catla* fish, milk, yogurt, curd, egg yolk, white rice, puffed rice, beaten paddy, wheat flour, potato, corn flakes	salt, sugar, tap water	egg albumen, dried fish (stored), raisin, spices, sunflower oil

Table 1. Some common foods with their pH value and availability

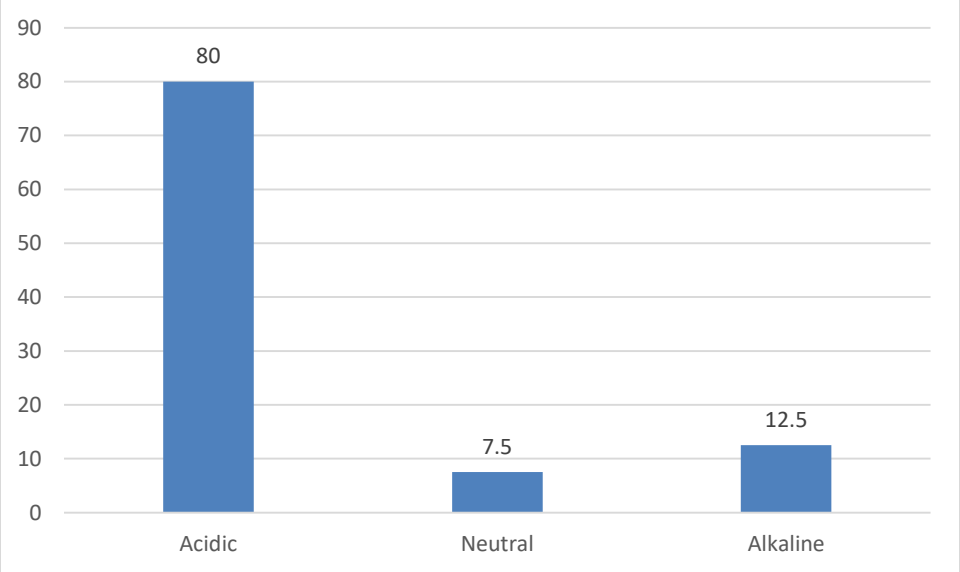

Figure 1. Types of foods with their percentage

CONCLUDING REMARKS

Since most foods are acidic, we should take those with a small amount and emphasize alkaline foods, especially vegetables and seasonal and regional fruits, and probiotics (yogurt has healthy bacteria). The most remarkable fact in nutrition is to follow a balanced and varied diet. During eating, proper chewing is a must because our saliva is alkaline. In addition, regular adequate physical exercise relieves excess gas (especially bloating) from the gut and stomach and will enhance our proper digestion.

Features	Examples	References
Defense line	Gastric acid acts as first line of defense	Cook, 1985; Martinsen *et al.,* 2005; Hunt et al., 2015
Stomach acidity	Secretion of gastric acid is not the same amount always	Orla-Jensen *et al.,* 1949; Carrion and Egan, 1990; Husebye *et al.,* 1992; Marchado *et al.,* 2008; Vormann and Remer, 2008; Schwalfenberg, 2012; Aviles-Jimenez *et al.,* 2014; Boron and Boulpaep, 2017; Raposa *et al.,* 2022
Chemical- and organ-mediated acid-base balance	Some organs are important for acid-base balance	Antia and Abraham, 1998
Herbivorous stomach	Herbivorous animals have 4-chambered stomach	Schoening, 1939; Eden, 1940; Parra, 1978; Chivers and Hladik, 1980; Van Soest, 1994; Lambert, 1998; Lambert and Fellner, 2012
Alkaline diets and chlorophyll contents	This has not scientific evidence on human body	WHO, 2013; Hanley and Whiting, 2013
High fibre content	Somebody has sensitivity to fibre contents	Young and Young, 2006; Hanley and Whiting, 2013; Fenten and Fenten, 2016
Fish or aquatic consumption	Aquatic organisms have both beneficial and harmful effect	Djuricic and Calder, 2021; von Shacky, 2021
Animal fat	In fact, this is not good for health but proportional use is accepted for remarkable taste	Bays *et al.,* 2021
Diseases for dietary restriction	Dietary restriction causes serious health injuries	Zhan *et al,* 2017; Hurtado-Barroso *et al,* 2020; Halvorsen *et al.,* 2021

Table 2. Some features with references

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