A Special Biological Evaluation for Some Food Industrial Wastes

Rasha M E Bhnsawy and Fadl E. El-Deeb*

Special Foods Department, Food Tech. Res. Inst., Agric. Res.Center, Giza, Egypt.
*Home Economics Dep. Fac. Specific Education, Domietta, Mansoura University, Egypt.
fadldeeb@yahoo.com

Abstract: It has been thought that gastric ulcer medication is associated a sort of contradiction to that of hypercholesterolemia. However, additional antioxidant nutrient intervention trials in populations have established an effect relationship from these findings. The boiological role of antioxidant content in three most common juse industrial wastes have been implicated in this complicated health issue, ie, the combined health complication therapy of hypercholestrolemia and stomach ulcer. This applying dietary therapy was explored using a 45 rats in nine experimental groups system. This orange (OP), apple (AP) and pomegranate (PP) peel wastes were examened for their content of special antioxidants acts againest substances that inevitably lead to oxidative stress hoping that these compounds, or some of them, can support the antioxidant defense and thereby reduce the damaging caused by either a single one or both together these diseases. The peels analysis showed more crude protein in OP, relatively higher both fat and CHO in AP, mainwhile PP contains more fat, ash and had more total polyphenols. In contrast, orange has much more vitamins A, E and β–Carotene. Concrning the other antioxidant nutrients, such as the polyphenols fractions namly p. coumaric, caffien, caumarin, cinnamic, naringinin, syringic and pyrogallol were found in OP that was effective as a mild hypocholestrolimic dietary agent. More pyrogallol in addition to caffic acid, P. OH benzoic, vanillic and chlorogenic were currently more shown in PP, which appears more significant againest ulceration. Apple is only good sourse for ferulic acid and salycilic which are absence in OP and make almost their 50% in PP and appeared of relatively less bioactive food treatment. In this evaluation of food industrial waste intervention againest ulceration and cholestrolemia the response included volume (V), the pH value, total acidity of gastric juice maintains the ulcer index (mm) of gastric juice using PP, while the influence of OP on serum total cholesterol level can be contributed to the whole antioxidant sbstances existed in this food waste fraction. Excluding the vitamins and antioxidant nutrients, polyphenols fractions noticed for each peel may play the main intervention role and a special mixer of OP and PP might became a respectable food therapy or ulternative therapy in case of such clinicl chomplication.

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1. Introduction

In fact, peptic ulcer is one of the most common gastrointestinal disorders in clinical practice. Most peptic ulcers arise in the two areas exposed to gastric acid and pepsin, as a hole in the gut lining of stomach, duodenum or esophagus *(Anekonda and Reddy, 2005)*. Although genesis of ulcers is multifactorial, they are essentially thought to arise due to an imbalance between offensive factors like acid and pepsin secretion, and defensive factors like mucin secretion, cell shedding, cell proliferation, inhibition of gastric mucosal prostaglandin synthesis, disruption of gastric mucosal barrier, reduction of gastric mucosal blood flow, inhibition of gastric mucus and bicarbonate secretion *(Lu and Graham, 2006 ; Ramakrishnan and Salinas, 2007).* Excess gastric acid production in response to food and hormonal stimulation is characteristic of these diseases. Therefore, it was postulated that excess acid production possibly from stress or diet were responsible for formation of ulcers *(Shaw, 1996).* It is also known that several endogenous factors are related to the pathophysiology of gastroprotection including prostaglandin E_2 (PGE_2), somatostatin, nitric oxide (NO) and sulfhydryl (SH) compounds, delayed gastric emptying, and duodenogastric bile reflux as they associated with gastric mucosal damage *(Tsukimi et al., 2001)*. The etiopathogenesis of gastric ulcer involves genetic factors, physiopathological disturbances and environmental factors such as alcohol or coffee consumption, pylorus ligation, steroids, smoking, stress, non-steroidal anti-inflammatory drugs (NSAIDs) and *Helicobacter pylori (Konturek et al., 2005), Helicobacter pylori* infection *(Levine and Rubesin, 1995)* and the use of nonsteroidal anti-inflammatory drugs (NSAIDs) like aspirin and indomethacin and the augmented acid secretion also contributes to this harmful process, as does the fact that NSAID provokes disturbances in the gastric microcirculation, increases neutrophil infiltration, induces TNF-α expression, and disrupts the balance between NO expression and apoptosis

(Konturek et al., 2002), besides provoking damage to the vascular endothelium, reduction of the blood flow, formation of obstructive micro-thrombi and activation of neutrophils *(Guth 1992).* Although early trials with nitric oxide donating NSAIDs have not been encouraging, NO-aspirin appears promising. By contrast, protection against ulcer complications by cotherapy with antisecretory drugs, e.g. proton pump inhibitor (PPI)) remains unproven and only available double-blind study of a PPI plus an NSAID in high risk NSAID users did not produce encouraging results. It remains to be seen whether the optimism with which these drugs are used for that indication is actually warranted *(Lu and Graham, 2006).* It has been reported that the major symptom of ulcer is a burning or gnawing feeling in the stomach area that lasts between 30 minutes and 3 hours. This pain is often interpreted as heartburn, indigestion or hunger. The pain usually occurs in the upper abdomen, but sometimes it may occur below the breastbone. In some individuals the pain occurs immediately after eating. In other individuals, the pain may not occur until hours after eating. The pain frequently awakens the person at night. Weeks of pain may be followed by weeks of not having pain. Pain can be relieved by drinking milk, eating, resting, or taking antacids. Appetite and weight loss are other symptoms, but person with duodenal ulcers may experience weight gain because the persons eat more to ease discomfort. Recurrent vomiting, blood in the stool and anemia are other symptoms. An estimation of about 20 percent of cancers of the stomach are of the ulcerating type. It has also been determined that 9 to 10 percent of lesions that can be considered possibly benign ulcers are, or become, malignant. It must therefore be determined by clinical measures (roentgenography, cytological examination of the gastric aspirate), or by surgery and histological examination whether a gastric ulcer is benign or malignant. The differentiation between benign and malignant gastric ulcer can be safely made if accurate observations during a trial management are made and if the patient is followed closely during the year after the first occurrence of the lesion and wisely counseled regarding the significance of possible recurrences *(Anekonda & Reddy, 2005 and Lu & Graham, 2006).* Earlier, 103 consecutive patients with active radiological proved duodenal ulcer were given alternately regular and bland diets. Daily dietary observations included foods consumed, foods rejected and the reasons for rejection, and foods causing discomfort. With few exceptions, patients in both groups consumed nutritionally adequate diets. Ulcer patients placed on regular diets did not generally select a bland diet from the regular tray served them. Patients previously conditioned by dietary instructions more frequently rejected food items that were served only on the regular diet as well as food served normally on bland diets. Discomfort following ingestion of a few food items suggests the possibility of poor tolerance by some ulcer patients. Clinical response and rate of healing of duodenal ulcer were the same in the two groups *(Buchman et al, 1969).* However, evidence is presented which suggests that settings of anxiety and tension can nullify the beneficial effects of a high fat meal on gastric acidity and motility. One should not count very heavily on the inhibitory effects of diet in peptic ulcer when the stomach is under stimulation from stressful situations in the patient's daily life. There is also a great need to study the true effects of certain so-called irritating foods, condiments, and chemicals on the stomach. In a fistulous subject, the direct application of commonly accepted irritants produced fewer and lesser changes in the stomach than on the skin. Similarly, the colon in ulcerative colitis responds more violently to certain situational stimuli than to foods and fecal contents *(Wolf, 1954).* Antiulcer drugs medication is used for a large variety of complaints, such as functional nonulcer dyspepsia, stomach upset, gastro-esophageal reflux, gastritis, and gastric or duodenal ulcer. Most dyspeptic symptoms are dealt with by the patient without seeking medical advice *(Jones et al., 1990; Isolauri and Laippala, 1995; Penston and Pounder, 1996)* or by using antacids *(Corder et al., 1996).* These drugs act via buffering the gastric pH and inactivating the major gastric protease pepsin *(McCarthy, 1991).* Since the beginning of the 1980s, antacids were to a great extent replaced by H2-receptor blockers *(Peden et al., 1979)* and proton pump inhibitors (PPIs) *(Richardson et al., 1998).* The highly potent, long acting PPIs and H2-receptor antagonists can almost totally abolish acid secretion *(Sharma et al., 1984 and Chiverton et al., 1989)*, although antisecretory therapy increasing the gastric pH above 3.0 is not necessary for ulcer healing *(Burget et al., 1990).* Increases of gastric pH might interfere with the physiological gate-keeping function of the stomach, e.g., the protective role of gastric acid against bacterial infections *(Cook, 1985; Howden & Hunt 1987 and Hunt 1988).* Moreover, gastric acidity is required for the activation of pepsinogens and the initiation of protein digestion. The optimal pH for proteolysis varies for different pepsins in gastric juices, but total enzyme activity has an optimum in the pH range of 1.8-3.2 *(Samloff, 1989).* Paradoxically, digestion-sensitive food proteins are among the most frequent elicitors of food allergy *(Yagami et al., 2000 and Fu et al., 2002).* However, *Untersmayr et al, (2003)* demonstrated in an animal model that antiulcer drugs turned digestion-labile fish proteins into potent elicitors of type I

hypersensitivity by elevating the gastric pH and impairing peptic digestion. Also, *Untersmayr et al. (2005)* strongly suggest that anti-ulcer treatment primes the development of IgE toward dietary compounds in long-term acid-suppressed patients. *Schöll et al. (2005)* suggest that the intake of antiulcer drugs may lead to the induction of immediate-type food hypersensitivity toward hazelnut. *Brunner et al. (2007)* show that parenterally applied sucralfate is able to induce a T helper 2 (Th2) response probably due to the aluminium content. This indicates that orally applied sucralfate may lead to an enhanced risk of food allergy not only by inhibiting peptic digestion but also by acting as a Th2 adjuvant. Moreover, *Schöll et al. (2007)* provided evidence that the anti-acid drug sucralfate supports sensitization against food in pregnant mice and favors a Th 2-milieu in their offspring. *Schöll et al. (2008)* added that anti-acid treatment with sucralfate induces changes in the structure of epithelium and villi, and increases eosinophils and mucus-producing cells in the intestine. Therefore, this medication leads to sensitization against food with changes typical for food allergy also in the intestine. Additionally, acid-suppression medications are frequently used for treatment of dyspeptic disorders. By increasing the gastric pH, they interfere substantially with the digestive function of the stomach, leading to persistence of labile food protein during gastric transit. Moreover, *Andrès et al. (2007)* stated that in elderly people, food-cobalamin malabsorption (vitamin B12 deficiency) syndrome is usually the consequence of atrophic gastritis, related or not to pH. pylori infection, and of the long-term ingestion of antacids and biguanides (in around 60% of patients).

It is also known that hypercholesterolemia is related to endothelial dysfunction at both the macro and microvascular level *(Stokes et al., 2002)*. Furthermore, decreasing serum cholesterol levels with exercise, diet and medications has been associated in numerous studies with improved outcome. There were several studies demonstrated that hypercholesterolemia actually has a positive effect in patients with heart failure *(Kalantar-Zadeh et al., 2004)*. Furthermore, several studies attempted to improve outcomes with cholesterol lowering medications in patients with heart failure have shown either neutral or negative results. Systematic investigation of genes, environmental factors, and their interactions in explaining the variance of lipoprotein levels indicate that 1) body mass index, smoking, and alcohol intake are strong predictors of blood lipid levels; and 2) their effects are only marginally modified by genetic background. However, clinical and epidemiologic data illustrate the need to expand the scope of therapies to reduce the residual cardiovascular risk associated with low HDL-C levels and elevated TG levels, even when LDL-C is managed successfully *(Cziraky et al., 2008)*.

However, additional antioxidant nutrient intervention trials in populations have established an effect relationship from these findings. Plant foods such as fruit, vegetables and their content of vitamins, minerals, and photochemical have improved antioxidant status and human health. This adequate antioxidant defense is also required to change body's first line of antioxidant defense in both the intra and extracellular compartments. Widespread interest in the possibility that selected foods might promote health has resulted in the coining of the term functional food, although agreement about what is and what is not a functional food is lacking *(Milner, 2000)*. Public interest in functional foods is increasing because of higher health care costs; the passage of federal legislation affecting many food categories, including the expanded category of dietary supplements; and recent scientific discoveries linking dietary habits with the development of many diseases, including coronary heart disease and some cancers. A variety of foods have been proposed as providing health benefits by altering one or more physiologic processes. Biomarkers are needed to assess the ability of functional foods or their bioactive components to modify disease and to evaluate the ability of these foods to promote health, growth, and well-being *(Milner, 2000)*. For example, polyphenols are abundant micronutrients in our diet and evidence for their role in the prevention of degenerative diseases such as cancer and cardiovascular diseases is emerging. The health effects of polyphenols depend on the amount consumed and on their bioavailability. This appears to differ greatly between the various polyphenols, and the most abundant polyphenols in our diet are not necessarily those that have the best bioavailability profile. A thorough knowledge of the bioavailability of the hundreds of dietary polyphenols will help us to identify those that are most likely to exert protective health effects *(Manach et al., 2004)*.Studies on the mechanisms of chemoprotection have focused on the biological activity of plant-based phenols and polyphenols, flavonoids, isoflavones, terpenes, and glucosinolates. Enhancing the phytonutrient content of plant foods through selective breeding or genetic improvement is a potent dietary option for disease prevention. However, most, if not all, of these bioactive compounds are bitter, acrid, or astringent and therefore aversive to the consumer. Some have long been viewed as plant-based toxins. As a result, the food industry routinely removes these compounds from plant foods through selective breeding and a variety of embittering processes. This posse is a dilemma for the designers of functional foods because increasing the content of bitter phytonutrients for health may be wholly incompatible with consumer acceptance. Studies on phytonutrients and health ought to take sensory factors and food preferences into account *(Drewnowski and Gomez-Carneros, 2000)*. For example, nuts are energy-dense foods, rich in total fat and unsaturated fatty acids. Its beneficial effects on vascular reactivity may be ascribed to several constituents of walnuts: l-arginine, the precursor of nitric oxide, α-linolenic acid and phenolic antioxidants. Although more studies are warranted, the emerging picture is that nut consumption beneficially influences cardiovascular risk beyond cholesterol lowering *(Ros, 2009)*. More cheap sources of bioactive nutrients are desirable and more practical. Fortunately, antioxidant flavonols and their major food source as black tea have been associated with a lower risk of ischemic heart disease (IHD) and stroke in Dutch men, but was weakly positively related to IHD mortality and cancer mortality while strongly related to total mortality. Men with the highest consumption of tea had better rate of dying in the follow-up period compared with men consuming less. it has been conclude that intake of antioxidant flavonols is not inversely associated with IHD risk in the United Kingdom. The apparent association between tea consumption and increased mortality in this population merits further investigation *(Hertog, et al., 1997)*. Furthermore, epidemiologic data indicate that individuals with low plasma concentrations of carotenoids and antioxidant vitamins and those who smoke cigarettes are at increased risk for age-related macular degeneration (AMD). Laboratory data show that carotenoids and antioxidant vitamins help to protect the retina from oxidative damage initiated in part by absorption of light. Primate retinas accumulate two carotenoids, lutein and zeaxanthin, as the macular pigment, which is most dense at the center of the fovea and declines rapidly in more peripheral regions. The retina also distributes alpha-tocopherol (vitamin E) in a no uniform spatial pattern. The region of monkey retinas where carotenoids and vitamin E are both low corresponds with a locus where early signs of AMD often appear in humans. The combination of evidence suggests that carotenoids and antioxidant vitamins may help to retard some of the destructive processes in the retina and the retinal pigment epithelium that lead to age-related degeneration of the macula *(Snodderly 1995)*. As a polyphenol fraction, betalains were recently identified as natural antioxidants. However, little is known about their bioavailability from dietary sources. To evaluate the bioavailability of betalains from dietary sources, plasma kinetics and urinary excretion of betalains were studied in healthy volunteers to show that cactus pear fruit is a source of bioavailable betalains and suggest that indicaxanthin and betanin may be involved in the observed protection of LDL against ex vivo-induced oxidative modifications *(Tesoriere et al., 2004)*.

So far, very short research work is published about more cheap sources of polyphenol or antioxidants in general and their health aspect. Here, polyphenol derived from some food industrial wastes were examined in treating both cholesterolemia and ulcer based on their contradiction during pharmaceutical therapy.

2. Materials and Meethods

Three food industrial wastes were collected from corresponding larg production project for orange, apple and pomegranate juces in egyptian delta and used as sourc samples. The proximate analysis as well as vitamins A and E of these food materials were determind according to the *AOAC (1990)*. In the determination of polyphenols, vitamin C, and β carotene, HPLC techniques according to *Betés-Saura et al., (1996)* were employed. Samples were prepared and their complete extraction are thus accomplished as ran earlier *(Watada,1982)*. Results expressed as mg/mL *(Sa´nchez-Mata and m 2000)*. Quantification was performed by external calibration with standards for undertaken soluts. The total polyphenol content (TPC) determined by Folin-Ciocalteu's reagent was carried out according to the procedure reported in the literature *(www.teausa.com)* with a modifications of working standards gradual at 25,50,100,150, and 200 ppm gallic acid solution prepared freshly each time at room temperature before analysis. Concentrations in ppm of polyphenols in final diluted solutions were mesured using x coefficient from the regression analysis correcting for dilution made during procedure.

Liquid chromatographic analysis of β-Carotene: β-Carotene was analyzed following the procedures of *Thayer and Björkman (1990)* using high performance liquid chromatography (HPLC) Agilent 1100 series equipped with auto sampler and quaternary pump, variable wavelength detector set at 254 nm and column compartment set at 35º, the separation was done using Hypersil ODS (250 x 4mm) 5 µm particle size. The column was equilibrated with degasser solvent A (acetonitrile–methanol–0.1 M Tris, pH 8; 19:3:1, v/v/v) and eluted as follows: solvent A at a flow-rate 1.5 ml/min for 6 min followed by solvent B (methanol–hexane; 4:1, v/v) at 2 ml/min for 10 min and then back to solvent A at 1.5 ml/min for 8 min. Quantification was done against a β-Carotene external standard using peak areas in ppm: mg solute per kg of plant crude powder.

The biological evaluation has been performed as described in Table (1) using nine groups (from G1 to G9) 9X5 = 45 aged albino rats of 364+/-9 g in the Opthelial experimental animal house, great Cairo. The adaption period 10 days was followed with an entire lenghth of 30 days. The determination of gastric volume, pH and total acidity were done according to *Denbath et al., (1974)*. Gastric ulceration index was calculating similar to *Robert et al., (1968)*.

Table 1: Dietary description of biological experement.

G	Treatments	Description
1	Negative control (G1)	Basel diet *(Bowman et al., 1990).*
2	Cholesterol (G2)	G1 + 1% cholesterol. *Ahmed et al., (2004).*
3	Ulcer (G3)	Gastric ulcer induction, according to *Agrawal et al., (2000)*.
4	Cholesterol + Ulcer (G4)	The double treatment, ie, both G2 and G3.
5	Ulcer treatment (G5)	G4 treated with artificial antiacid drug.
6	Cholesterol treatment (G6)	G4 treated with artificial hypocholestrolemic drug.
7	OP (G7)	G4 treated with Orange peel 10%.
8	AP (G8)	G4 treated with Apple peel 10%.
9	PP (G9)	G4 treated with Pomegranate peel 10%.

Where: G, animal group; OP , AP and PP: Orange, Apple and Pomegranate peels, respectively.

3. Results and Discussion

As it has been hypnotized that gastric ulcer synthetic medication contradicts that of hypercholesterolemia, dietary therapy might become important way in treating this dilemma. However, additional antioxidant (AO) nutrient intervention trials in populations have established an effect relationship from these findings. Finding new sources for an AO cockatiel of special health aspect is necessary. In Table 2, the proximate chemical composition of three dried fruit peels wastes, as cheep AO sourese were recoded to find that their moisture content are around 10% with more crude protein in orang peel (OP), relatively higher both fat and CHO in appel peel (AP), mainwhile pomegranate peel (PP) gave moer fat and ash. Pomegranate, as in Table 3, also contained more total polyphenols, meanwhile orange has much more vitamin A, vitamin E and β–carotene.

The polyphenols fractions of ppm in those food waste peels are listed in Table 4. Additional better fractions of polyphenol such as p.coumaric, caffien, caumarin, cinnamic, naringinin, syringic and pyrogallol were also found in orang peel.

However, PP seems to be richer of pyrogallol in addition to caffic acid, p.OH benzoic, vanillic and chlorogenic. Apple is only good as sourse of ferulic acid and salycilic which are absence in OP and make almost their 50% in pomegranate peel. They cnsedered to be inactive polyphenol fraction according to their relatively less biological role as meight be extracted from Table 5.

Table (2) Proximate chemical composition of the three dried fruit peels wastes.

#	**Plant waste**	***Moisture%***	***Crude protein***	***Fat%***	***Ash%***	***Fiber%***	**CHO%**
1	OP	11.42	8.63	4.61	4.24	9.80	61.31
2	AP	9.02	3.78	5.42	2.46	8.05	71.27
3	PP	12.10	5.09	2.80	4.41	11.69	63.65
L.S.D. at 5%		*0.447*	*0.448*	*0.424*	*0.124*	*0.836*	*0.753*
1%		*0.742*	*0.742*	*0.703*	*0.206*	*1.386*	*2.907*

Table (3) Antioxidant composition of some dried fruit peels wastes in ppm.

#	**Plant waste**	**Total Polyphenols**	**Vitamin A**	**Vitamin E**	**β -Carotene**
1	OP	*6899323.7*	*161218.9*	*116.9*	*3.9*
2	AP	*2416117.3*	*86631.6*	*57.0*	*0.9*
3	PP	*9366458.2*	*101904.9*	*90.1*	*0.5*
L.S.D. at 5%		*30.356*	*11.258*	*3.219*	*0.115*
1%		*31.627*	*12.545*	*3.986*	*0.191*

Table (4) Polyphenols fraction in ppm in some food wastes peels.

#	Polyphenols fraction	Pomegranate peel (PP)	Appel peel (AP)	Orang peel (OP)
1	p.coumaric	111.9	185.4	342.9
2	Ferulic acid	24.7	46.1	0
3	Caffien	643918.0	267897.0	1057941.9
4	Chrisin	0	0	0
5	Caumarin	38216.9	93274.4	757947.4
6	Caffic acid	696565.8	144772.1	252224.3
7	P.OH Benzoic	7970587	1824801	4427384
8	Cinnamic	4556.5	0	211737.4
9	Vanillic	140.8	29.3	58.1
10	Chlorogenic	283	21.4	144.1
11	Naringinin	8728	84980	188526
12	Syringic	44	31	72
13	Pyrogallol	3239	0	2945
14	Salycilic	43	80	0

However, to biologically evaluat these food chemical patterns, ulcerd and aged rats with hypercholestrolimea, as most sensitive age cycle for those antioxidant combination were used. Peels addition at dietary level of 10% were examined. Table (5) as mentioned above recorded the effect of these treatments on the volume (V), the pH value, total acidity of gastric juice, the ulcer index (mm) of gastric juice and total cholesterol TC in rats treated for 3wk was conducted. In general, a real sort of metabolic complication upon treating animal ulcer whom sufering hypercholestrolemia can be noticed. Taking in consederation the HDL/TC and ulcer index, OP treatment seems to be the most conveniant for both to degenerative diseaes followed with PP intervention. In fact, PP is the best in treating ulcer alon and this most probably due to lowering both pH value and total acidity but not gastric juice secretion (Table 5). Likewise, in an experiment undertaken in dogs with midintestinal fistulas to determine whether guar added to a meal of solid food would disrupt gastric sieving and give rise to maldigestion of solid food using an isotope ratio method to determine how much [14C] triolein was absorbed at midintestine. It has been found that guar in a dose-related fashion increased the weight of chyme collected at midintestine, markedly reduced the percent of triolein absorbed by midintestine from 88 to 38%, and profoundly increased the passage to midintestine of large, poorly digestible pieces of steak and liver solid foods. The viscosity of the guar promoted the GI transit of large, poorly digestible pieces of food but also reduced absorption by other mechanisms *(Meyer and Doty,1988)*. In general discussion and conclusion, PP has been found to be richer than OP in total polyphenol and poorer in containing vitamin E. Earliar, in an animal trial, the photographs were independently rated by three pathologists on a 4-point scale from 1 (no ulceration) to 4 (severe ulceration) to conclude that the mean ulceration rating for the vitamin E group was 1.92, and the rating for the control group was 3.42, indicating that vitamin E has significant preventive properties in relation to the production of stress-induced gastric ulcers in the rat *(Kangas, et al., 1972)*.

Table (5): Effect of treatments on the volume (V), the pH value, total acidity of gastric juice and the ulcer index (mm) of gastric juice in rats in 3wk

#	Treatments	V in ml	pH	Total acidity	Ulcer index	Plasma TC	HDL	HDL/TC
1	Negative control (G1)	0.325f	4.542cd	0.175g	0.000e	76.04h	48.97ab	0.645
2	Ulcer (G2)	0.833a	3.168f	0.747a	9.000a	77.82h	46.99c	0.603
3	Cholesterol (G3)	0.550d	4.262d	0.427d	0.833e	163.52a	43.87c	0.268
4	Cholesterol + Ulcer (G4)	0.750b	3.572e	0.617b	7.500b	168.44b	43.95d	0.262
5	Ulcer treatment (G5)	0.325f	5.747a	0.158g	0.667e	168.47b	45.02d	0.268
6	Cholesterol treatment (G6)	0.658c	3.483e	0.585bc	7.500b	89.99g	50.16a	0.556
7	OP 10% (G7)	0.333f	5.292b	0.353e	4.500c	99.54f	48.44bc	0.484
8	AP 10% (G8)	0.592d	4.430cd	0.540c	5.167c	132.11c	47.57bc	0.264
10	PP 10% (G9)	0.350f	5.693a	0.133g	0.833e	116.31e	48.87ab	0.422

LSD at 1% Time 0.113 and 0.151, Treatment 0.086 and 0.370 Interaction NS

Total Cholesterol (TC) LSD at Time 1.851, Treatment 3.207, Interaction 6.413 at 5% and these were 2.440, 4.227 and 8.454 at 1%. Means of time followed by same superscript capital letter(s) are not significantly different at 5% level. Means of treatments followed by same capital letter(s) are not significantly different at 5% level. Means of time followed by same letter(s) are not significantly different at 5% level.

HDL LSD at 5% was Time 0.83, Treatment 1.44, Interaction 2.88 ,which were 1.09, 1.90 and 3.80 at 1% level, respectively. Means of time followed by same superscript capital letter(s) are not significantly different at 5% level. Means of treatments followed by same capital letter(s) are not significantly different at 5% level. Means of time followed by same letter(s) are not significantly different at 5% level.

This strongly suggests a special role for Polyphenols. The hormonal oxidative balance health role of food and drug was suggested (*Ahmed et al., 2003*). Moreover, ppercentage distribution of fatty acids in subcutaneous adipose tissue of patients with peptic ulcer disease was explored. *Seidelin et al., (1993)* stated that dietary linoleic acid has been implicated in the pathogenesis of peptic ulcer disease because its metabolite arachidonic acid may be converted to cytoprotective prostaglandins. Table 2 shows that OP contains more fat. In addition, it has been suggested that the falling incidence and virulence of duodenal ulcer disease is related to increased dietary polyunsaturated essential fatty acid intake. In the present study the percentage content of linoleic acid in subcutaneous adipose tissue microbiopsies were used to see whether changes in percentage of fatty acids correlate with the presence or absence of an ulcer in individual patients. No significant difference in the adipose tissue content of linoleic acid was found in patients with peptic ulcer disease and matched control subjects *(Seidelin et al., 1993)*. Seemingly, more vitamins A and E in addition to high b-carotene level may be suitable in preventing hypercholesterolemia. This suggests that increased consumption of vitamin A may prove to reduce mortality rates due to heart disease and peptic ulcer. All the investigated mortality rates were in statistically significant positive association with increasing total fat consumption. Mortality rates of ischemic heart disease as well as of hypertensive and cerebrovascular diseases were in positive association with both plant fat and animal fat. These findings suggest that reduced total fat intake may prove to reduce the investigated mortality rates. Diabetes mellitus was in statistically significant inverse association with the average per capital consumption of fruits and vegetables *(Palgi, 1981).* In connection, artificial drugs severly abundunt the the complication between the two diseases as seen in Table 5 groups 4 to 6. Evidence suggests that several biomarkers may be useful for distinguishing between diseased and no diseased states and even for predicting future susceptibility to disease. A variety of biomarkers will probably be needed to develop a profile for an individual that reflects the impact of diet on performance and health. The hormonal oxidative balance health role of food and drug, for instance, was suggested *(Ahmed et al., 2003).* Another area of interest is the interaction of nutrients and their association with genetics. These interactions may account for the inconsistent interrelations observed between specific dietary constituents and the incidence of disease. Greater understanding of how diet influences a person's genetic potential, overall performance, and susceptibility to disease can have enormous implications for society. As new discoveries are made in this area, consumers will need access to this information so that they can make informed decisions *(Milner, 2000)*. The nature and contents of the various polyphenols in food sources, the influence of agricultural practices and industrial processes, dietary intakes for each class of polyphenols, bioavailability of polyphenols with particular focus on intestinal absorption and the influence of chemical structure, eg, glycosylation, esterification, and polymerization, food matrix, role of microflora in the catabolism of polyphenols and the production of some active metabolites, intestinal and hepatic conjugation, ie, methylation, glucuronidation, sulfation, plasma transport, and elimination in bile and urine, identification of circulating metabolites, cellular uptake, intracellular metabolism with possible deconjugation, biological properties of the conjugated metabolites, and specific accumulation in some target tissues are proposed factors affect polyphenols health role *(Manach et al., 2004)*. Accordingly, the PP action can be attributed to one or more of the polyphenol fractions such as caffic acid, P.OH benzoic, vanillic, chlorogenic or pyrogallol. The hypocholestrolemic effect of OP might be due to p.coumaric, caffien, caumarin, cinnamic, naringinin and syringic or one of them. Both the two distengushale medical effect might be shered with other nutrint like vitamenes, meniral ions, fats or, for instance, some dietary fiber. In short, orange peel administration had hypocholestrolmic effect, meanwhile, pomegranate one seems to be effective against ulceration. In fact, both PP and OP as very cheep source of health function when administrated together in the dietary pattern of patient sufering of either cholesterolemia or peptic ulcer or both together might introduce a sort of solution for this clinical complication.

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