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“What are we eating?” A theological-ethical analysis of the effects of food additives on human beings, especially in South Africa

ABSTRACT

This article discusses Christian theological-ethical questions related to the processing of food and especially to the widespread use of food additives. First, the aims, parameters and methodology of the article are discussed. Secondly, the theme of food in the Bible is briefly explored, along with its theological implications. Thirdly, the wider cultural context of food production and processing is noted, along with the commercialisation of food. Next, the nature of food additives of various kinds, the reasons for their use and their effects on human beings are analysed to determine the extent to which their use is injurious or harmless. Throughout, and especially in the final section, a theological-ethical analysis of the use of food additives, especially in a South African context, is provided.

1. INTRODUCTION

Currently, South Africans face a host of challenges. These include dealing with the personal, social, and economic ravages of the COVID-19 pandemic and challenges related to land, justice, unemployment, corruption, service delivery, widespread poverty, and food insecurity. Indeed, the COVID-19 pandemic has highlighted the desperation of the hungry and the need for food security. The need to address food safety and the use of food additives is also vital.



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2. AIMS, PARAMETERS AND METHODOLOGY

This article aims to investigate the effects of the widespread use of food additives in the processing of the food we eat. Such research is important not only globally, but also within a southern African context, where access to good food is crucial. The quality of the food consumed is an ethical issue because of widespread health risks, such as diabetes, myocardial infarction (heart attack), hypertension and tuberculosis, together with moral norms such as justice. Poignantly, obesity exists alongside poverty and severe malnutrition.

The theme of food and faith, or a theology of food, is a broad one. Several scholars such as McFague (2013), Wirzba (2011) and Conradie (2016a, 2016b, 2019) have addressed it:

Food is the sine qua non of existence; it sums up the entire corporeal planet, which is created by energy and is sustained by food; the evolutionary story is the tale of who gets food and who does not; and wars increasingly will be fought over food. As we consider the dual crises facing our planet – climate change and unjust resource distribution – we see that they are all about food (McFague 2013:202).

In his book, *Food and faith: A theology of eating* (2011:xiii), Wirzba critiques

the degraded understanding of the meaning of food in advanced industrial societies where speed, convenience and cheap prices have become the most valued drivers in food consumption (in Conradie 2015:15).

With reference to food, Conradie has drawn attention to several key questions, including how much we eat, what we eat, how nutritious the food is, as well as how, when, with whom and where we eat (Conradie 2016a:2). This research focuses on *what* we eat, how *nutritious* the food is, how it is *processed* before it reaches our tables, and which *food additives* we consume. The essence of the research problem is to ascertain whether what we consume is injurious to health.

Space does not permit a discussion of the wider ambit of food production in an African context. However, we can note that, in addition to hazards such as “malaria, safe drinking water, and basic sanitation”, Africans are also faced with the health threats of industrialisation, urbanisation, pollution, land degradation, climate change, heavy metals, pesticides, as well as plastic, domestic and hazardous waste (Nweke & Sanders 2009:863, 868). Other important matters that are not discussed in this article include the use

of genetically modified (GM) seeds, pesticides and fertilisers or the use of hormones and steroids for animals.¹

Global agribusiness means that international conglomerates can gain control over agriculture. African governments, therefore, need to invest in agriculture, from large-scale commercial farming to home gardens. Especially important is the use of diverse local seeds, seed sharing, biodiversity, the non-pollutant use of land, and the restoration of the soil (Bassey 2001:195-202). Also imperative in South Africa is a just and workable resolution to land access and its use as a means of producing a secure food supply for all the country's inhabitants.

In terms of methodology, the article draws on Macquarrie's (1966:4) well-known formative factors of theology, namely experience, revelation, Scripture, tradition, culture, and reason. Experience is discussed first; revelation, Scripture and tradition are discussed in a single section. This is followed by a consideration of food and culture. Ethical reasoning is employed throughout, especially in the theological-ethical analysis at the end of the article.

This article draws on theological research related to food, as well as local and international sources from the health² and social sciences that identify the ethical implications of the use of food additives. The article is theoretical in nature and draws on the theoretical and empirical research of other scholars.

In this analysis, a theological-ethical approach can be defined as a critical reflection from a Christian³ perspective on moral norms and values, as well as the perceptions, character, and behaviour of human beings – individually and collectively. (We return to this point in section 5 below.) Gustafson (1981:69) points out that Christian ethics,

on the whole, has had a very practical purpose: to assist morally serious Christian people to make proper moral judgements and engage in right moral actions, and to stimulate Christian people to reform (or in some cases defend) the social arrangements of their societies and of the human community as a whole.

1 Some years ago, De Gruchy (2003:82-93) discussed seeds, food sovereignty, GM crops and community-building. For a later discussion of GM crops, see Oriola (2002:514-573), Tung (2014:109-128) and Kotzé (2016:1-11). On GM food and the bovine somatotrophin growth hormone (rbST) in milk cows, see Van der Walt (2014).

2 A colleague who has a doctorate in pharmacology read the article prior to submission.

3 The Jewish tradition has, for centuries, had kosher (or kashrut) food laws (see Hewamanage 2016), while Islam has its halal provisions (see Tayob 2016). Both specify what food is fit or lawful for consumption.

This critical analysis, and its practical purpose, includes an investigation of the “social arrangements” of the cultural ethos of the production, processing, and consumption of food. In particular, this article discusses the ethical issues related to the inclusion of additives in processed food.

3. EXPERIENCE

My interest in this subject is both personal and academic. I have inherited family genes that make my body susceptible to gout and arthritis. I have clear memories of two aunts who endured severe pain and struggled to walk in old age. A few years ago, I began to experience a significant reduction in mobility and a concomitant increase in pain. I first sought medical advice, but the negative side effects of painkillers and anti-inflammatory medication led me to change my food intake. Some early reading included books with the suggestive titles of *Let food be your medicine* (Creed 2003) and *Food is better medicine than drugs* (Holford & Burne 2006). Below, I also refer to the research and experience of others. This is in line with the view that

[h]uman experience is prior to reflection. We reflect on human experience itself, and on objects perceived, interpreted, and known through our experiences of them and the experiences of others (Gustafson 1981:115).

4. FOOD IN THE BIBLE (REVELATION)

Information about what people ate in biblical times is not only interesting, but also closely interwoven with theological meaning (Marshall *et al.* 1996). Hence, what was consumed, and the close links between food, worship, community, and justice are discussed below.

4.1 The consumption of food in the Bible

In the early chapters of Genesis (Gen. 1:29-30; 2:16), seed-bearing plants and fruit-bearing trees are mentioned as constituting food for human beings. After the Fall, food production is viewed as including toil (Gen. 3:17-19), and food now includes the use of animals, though not the consumption of blood (Gen. 8:22-9:4). The semi-nomadic Patriarchs ate the meat and milk products of their cattle, sheep, and goats, but grain and bread are also mentioned as foods (Gen. 21:14; 26:12-14; 37:6-7; 42:2).

After leaving Egypt, the Hebrews longed for the fish, cucumbers, leeks, melons, onions, and garlic they had eaten there (Num. 11:5). Except for the rich, Israelites seldom ate meat such as lamb, goat, desert game and beef,

although kids, calves or lamb were served to guests (Gen. 18:6-8; Judg. 6:19; 2 Sam. 12:4).⁴ The lists of food supplied to King Solomon included significant amounts of meat (1 Kings 4:7, 22-23), but the ordinary people subsisted mainly on staples such as grain (barley, wheat, and spelt), bread, milk (including butter, curds, and cheese), water, olive oil, wine, and vegetables (Deut. 7:13; 8:8; Neh. 5:11; Hos. 2:8; Isa. 28:25). Lentil soup was popular (Gen 25:29-34) and guests could be treated with servings of nuts (pistachio and almonds) and honey (Gen. 43:11).

Fresh and sun-dried figs were prized (1 Chron. 12:40; Neh. 13:15). Vineyards provided grapes (Num. 6:3; Deut. 23:24) and raisins (1 Sam. 25:18; 30:12). Grape juice and various potencies of wine were also produced (Deut. 32:14; Prov. 3:10; Hos. 4:11; Joel 1:5; Amos 9:13). Olives were eaten and their oil was used extensively for cooking, and in bread or cake (Ex. 29:2; 1 Kings 17:12). Pomegranates and their juice were consumed (Can 8:2) as were various nuts, including almonds (Jer. 1:11). Gardens were used to cultivate vegetables and fruit (1 Kings 21:2; Can 4:16; Jer 29:5, 28; Amos 9:14) and edible seeds such as lentils, beans, and chickpeas (2 Sam 17:28; Ezek. 4:9). During the Passover festival (*Pesach*), only unleavened food could be eaten (Ex. 12:19; 13:7; 1 Cor. 5:7-8).

In New Testament times, the diet was much the same. Vegetable foods included cereals made from wheat flour (Matt. 13:33; Luke 13:21) or the cheaper barley flour (John 6:9, 13; 2 Kings 4:42). Significantly, Jesus is spoken of as the Bread of Life (John 6:33, 35). Spices and herbs such as dill, cumin, mint (Isa. 28:25, 27; Matt. 23:23) and coriander (Ex. 16:31; Nm 11:7) were used to season food. In Matthew 13:31-32, we read of the mustard plant; the leaves could be chopped up and added to food. Meat was eaten, but not in significant amounts. Eggs are mentioned in Luke 11:12, and the edible insect, the locust, was eaten with wild honey by John the Baptist (Mark 1:6). Fresh and dried fish was eaten (Mark 6:41-44).

4.2 Food, worship, community, and justice

First, in the Bible, food is inextricably part of creation, and is viewed as a *gift of God*. In Psalm 104, not only human beings, but also animals and other

⁴ Animals were classified as clean or unclean (Lev. 11). Cud-chewing animals with split hooves (for example, cattle and sheep) were regarded as "clean" and could be eaten, but others (for example, pigs) were considered "unclean" and Jews were prohibited from eating them. Birds, except birds of prey, could be eaten. Fish with fins and scales could be eaten, but not aquatic creatures such as shellfish (Lev. 11:9-12). Adherence to such "food laws" was a sign of obedience to God, holiness, their distinctiveness from other nations and purity. In a pre-refrigeration age, the taboo against consuming pork and shellfish probably saved the lives of many.

creatures receive their sustenance from the hand of God. While food is found in the wild, and grown by human effort, in an ultimate sense, it is viewed as being provided by God (Ps. 136:25; 145:15-16), and sacrificial animals were offered to God (Deut. 12:13-28; Luke 2:22-23). Food, in the form of bread and wine, also features at the last supper, when Jesus introduced what became the Eucharist or Holy Communion (Matt. 26:26-29; 1 Cor. 11:23-26). Thereafter, Jesus himself becomes the sacrifice offered for the forgiveness of sins (Heb. 10:1-18).

Secondly, food is central to the *sustenance* of life, relationships, celebration, and community. Without food, no living creature can survive. It fosters sound relationships and is important in the making of agreements between individuals and groups (Gen. 31:54). At the Jerusalem conference (Acts 15), a provision about food was central to the compromise reached to enable Christians of Jewish and Gentile descent to eat together. Food was also important at celebrations such as weddings and festivals. Food was integral to the Passover and harvest festival or first fruits (Lev. 23:15-21; Num. 28:26-31). Fasting, or abstaining from food, was linked to prayer and part of festivals, such as the Day of the Atonement (Lev. 23:26-32). Fasting continues to be practised in devout Jewish homes nowadays as a sign of repentance. Food was also closely linked to family and community life. There were no pre-packaged dinners to be consumed in front of a television!

Thirdly, in order to preserve *social and environmental justice*, the law also prescribed that just weights, measures and the balances used for scales be used in the measurement of food (Lev. 19:35-37; Ezek. 45:10). Prophets such as Micah spoke against merchants who used deceitful weights (Mic. 6:11), thereby defrauding others and benefiting undeservedly. The law further specified wise and just ethical agricultural norms, such as leaving the land to lie fallow every seventh year (Lev. 25:1-7) and allowing the poor to glean the edges of the fields (Lev. 23:22). Dire warnings of famine were sounded if such ethical norms were not followed (Lev 26:14-20). Animals were not simply to be used and consumed, but also cared for and respected as God's creatures. Thus, even on the Sabbath, a sheep that had fallen into a pit had to be rescued (Matt 12:11-12).

Fourthly, much of what was eaten in Israel at that time is similar to what is eaten in that region at present – some nutritionists call it the “Mediterranean diet”. However, the cultural practices of this one area of the globe cannot be regarded as mandatory. If the history of the Jewish people had played out in Norway or South Africa, their diet would have been different. However, a diet rich in local, organically grown fresh vegetables and fruit has definite *health and environmental benefits*.

Fifthly, in biblical times, *food safety and food laws* were important. Following the establishment of churches outside Israel, however, food laws (theological provisions regarding food) were largely abolished (Acts 15:19-20, 28-29; Col. 2:16-17). Except for certain church traditions such as the Catholic practice of not eating meat on a Friday, Christians moved away from restrictions regarding food. This now makes it more difficult to respond to the need for food safety, hence the emergence in recent years of theological publications, including this one, to address this lacuna.

Sixthly, *natural means* of food production were used and there was hardly anything in the way of “processing” or “packaging”. Food was consumed relatively quickly or else preserved, for example, in vinegar, oil and clay jars. This is very different from the contemporary commercialisation of food. Natural fertilisers, including manure, were used on farms. Contemporary hormones, steroids, antibiotics, and preservatives were unknown. Although we cannot easily return to a pre-industrial world, we can become better informed and exert pressure on food producers and processors to ensure that what we eat is healthy.

5. CULTURE AND FOOD

Culture and cultural change play a significant role in the production, processing, and consumption of food.

5.1 The commercialisation of food

Compared to food in biblical times, the production, processing, and packaging of food are very different at present. Due to much higher levels of urbanisation, food needs to be delivered to cities in great volumes. Agribusiness has developed on a global scale, along with the need to preserve, package and transport food. Moreover, the processing of food has been highly commercialised, especially with the growth of huge food-processing factories and supermarkets. Initially a largely Western cultural phenomenon, large-scale food processing is now found in many parts of the world.

Globalisation has further contributed to the transportation of food across the world. This has necessitated the use of different means to preserve food, such as refrigeration and sealing food in tins or other packaging to preserve its “shelf life”. Moreover, all sorts of “ready-to-eat” meals are available, ranging from “fast foods” (hamburgers and fried chicken) to food sold in cardboard, paper, foil, or plastic packaging by supermarkets. Additives are widely used in the processing of these types of food.

A further cultural factor is that of increasing “busyness”. As both parents often work, either to generate extra income or from dire necessity, less time is available for growing and cooking food in more traditional ways. This has also contributed to the problem of unwise consumption – many people turn to “convenience food”, with convenience replacing nourishment (Minich 2009:12).

Resistance to such trends can be noted in the “slow food” movement, and the stress on both organic and local food production.

5.2 The function of food processing and types of additives

Food processing is a complex process, and simplistic answers are unsatisfactory. Many forms of processing are not harmful and are needed to preserve food from spoiling. What is necessary, and difficult, is to become more informed about which processes and additives are necessary and safe. Ohiokpehai (2003:174) helpfully identifies six principles that govern food processing, the last of which is particularly pertinent in this instance:

Moisture removal – drying, dehydration and concentration.

Heat treatment – blanching, pasteurisation and sterilization.

Low-temperature treatment – refrigeration and freezing.

Acidity control – fermentation and acidic additives.

Irradiation.

Addition of chemical additives.

Natural preservation processes include the use of salt, vinegar, smoking and drying – these have been used for thousands of years. For instance, ham and sausages have been smoked, olives preserved in brine, cabbage pickled in vinegar (*sauerkraut*), fruit dried in the sun, and both dried or salted fish and meat. Nowadays, antioxidants such as vitamins C and E are used to prevent decolourisation; acids such as citric, lactic, tartaric, and acetic prevent spoilage, and salt (sodium chloride) is used as a preservative (Ohiokpehai 2003:174-175).

Food additives are natural or synthetic substances added to food when it is processed to enhance its flavour or appearance, or to preserve it. Food additives include “acidifiers, acidity regulators, anti-caking agents, anti-foaming agents, antioxidants, bulking agents, carriers, colorants, preserving agents and sweeteners” (Ratescu 2010:401). The synthetic or artificial chemical substances used in food processing are the most problematic.

It is possible to discuss only a few additives in more detail. These are the *trans fats* and *refined oils* commonly used in processed foods, and the *sugar* and *artificial sweeteners* added to food and beverages. Other food additives are flavour enhancers, such as *monosodium glutamate* (MSG or E621). Also discussed are *sodium sulphites* (or sulphites), sometimes labelled as sulphur dioxide, potassium bisulphate or sodium bisulphate. The last category discussed is *dyes and colourants*, including FD and C yellow number 5 (or Tartrazine, E102) and FD and C yellow number 6 (or Sunset Yellow E110).⁵

5.3 The effects of specific food additives on human beings

Generally, older types of food additives have no, or only minor, side effects. However, the use of artificial food additives has provoked debate. For instance, Davis (1963:604-616) criticised the uniform rejection of all food processing and was generally in favour of its use. However, since the 1960s, many hundreds of synthetic additives have been developed, some of which are problematic (Hanssen & Marsden 1987). Minich (2009:55-140) lists close to 150 additives.⁶ She classifies less than half as “safe to eat, may be nutritious”, but all the rest are classified as “most likely safe, but cut back”, “reasonably safe, but limit quantities”, “safety questionable, try to avoid” or “do not eat foods with this additive”. Thus, the uninformed consumption of the majority of the additives contained in processed food poses health risks.

5.3.1 Trans fats

The widespread use of fats, trans fats and refined oils, including partially hydrogenated oils (PHOs), in fast foods and other products such as snacks, baked and fried foods is problematic. These include hot-pressed vegetable oils and margarine, which are further “purified” by the addition of acid, or alkali and bleach. Hydrogenated oil (the addition of hydrogen turns the fat into a solid) increases the stability and prolongs the shelf life of food products, thereby creating “trans fats”. Trans fats are associated with obesity and cardiovascular disease:

Partially hydrogenated oils can affect heart health because they increase “bad” (low-density lipoprotein, or LDL) cholesterol and lower “good” (high-density lipoprotein, or HDL) cholesterol. On the other hand, a fully hydrogenated oil contains very little trans fat, mostly saturated fat, and doesn’t carry the same health risks as trans fat (Cherney & Butler 2018; see also Henry 2009:295).

5 FD and C dyes is an abbreviation for Food, Drug and Cosmetic dyes.

6 Winter’s (2004:49-543) more detailed list contains hundreds of additives in nearly 500 pages of text. See also the *Codex Alimentarius* below that lists many more.

In addition, Ruemmele (2016:33-41) points out the links between these fats and the growing incidence of inflammatory bowel disease (IBD). Ironically, previously maligned animal fat and butter, together with cold-pressed olive oil, are safer to consume.

5.3.2 Sugar

An analysis of the use of sugar as an additive is particularly important in a South African context, where diet-related diseases are common. People not only consume sugar in tea and coffee, but it is also found in sugar-sweetened beverages (SSB, also called cold or soft drinks and sodas) and sports drinks. Sugar is a significant ingredient in many pre-packaged foods such as cakes, biscuits, fast food, snacks, breakfast cereals, ice cream, and yoghurt. It has been suggested that women should not consume more than six, and men not more than nine teaspoons of sugar per day (one teaspoon amounts to 4.2 grams of sugar) as contained in *all* the food they eat. However, a single 300 ml can of Coke contains 31.8 grams (7.57 teaspoons) of sugar.

According to Holford and Burne (2006:1):

a teenager drinking one fizzy drink a day could put on 14lbs (6.4kg) a year – thus moving a step closer to developing diabetes or heart disease later in life.

In the USA:

From 1989 to 2008, calories from sugary beverages increased by 60% in children ages 6 to 11, from 130 to 209 calories per day, and the percentage of children consuming them rose from 79% to 91% (Chan 2020).

Several yoghurt products available in supermarkets proudly proclaim that they are “fat free”. However, significant amounts of sugar, up to 10% of a serving, have been added, and these products are often given to children. Weaver-Hightower (2011:15-21) states that inferior school food is a major cause of obesity in children. Thus, researchers in the USA suspect that the increased use of manufactured high-fructose corn sweeteners (by 1000% between 1970 and 1990) in food and beverages is a significant cause of obesity (Winter 2004:23-24).

Producers claim that the addition of sugar “improves” the taste, but the health effects of the consumption of large amounts of sugar are extremely negative. According to a recent study:

Our findings indicate that most US adults consume more added sugar than is recommended for a healthy diet. A higher percentage of calories

from added sugar is associated with significantly increased risk of CVD [cardiovascular disease] mortality. In addition, regular consumption of sugar-sweetened beverages is associated with elevated CVD mortality (Yang *et al.* 2014:n.p.).

The increased consumption of fast foods

has led to incidence[s] of the risk of breast, colon and prostate cancer. [Because] [p]rocesed fast foods are made up of high salt, sugar and fats with additives to hold these constituents (Gopalan 2001:1213).

Inflammatory bowel disease is much more common, due to diets “characterized by high protein and fat as well as excessive sugar intake, with less vegetables and fiber” (Ruemmele 2016:34).

Like nicotine, sugar can be addictive. Cutting down on sugar is, therefore, not easy. According to a recent book on the controversial “Banting” diet, when carbohydrates are eaten,

insulin is secreted by the pancreas in response to the glucose entering the bloodstream from the gut. ... If a carbohydrate cannot be removed immediately from the body (e.g. being burned off through exercise) it gets converted by the liver into fat and sent to our fat tissues for storage (Noakes *et al.* 2014:23).

Hence, a diet high in carbohydrates and sugar exacerbates health conditions such as obesity, gout, diabetes, and heart problems. Tragically, many poor people consume mass-produced bread and cold drinks. These provide a short spike of energy but have no lasting nutritional or health value.

5.3.3 Aspartame

Some consumers, in their effort to replace sugar, choose to consume “diet” or “sugar-free” sodas. However, these are even more problematic and ethically dubious because they contain artificial, chemically produced sweeteners. These low-calorie sweeteners (LCS) such as aspartame (or phenylalaline), Sucralose, NutraSweet®, and acesulfame-K may be recommended to patients who are overweight or suffer from diabetes. Aspartame is a commonly used artificial sweetener that is approximately 200 times sweeter than sugar. It is used in many “sugar-free” products, such as breakfast cereals, diet soft drinks, tea or coffee beverages, desserts, juices, milk drinks, and yoghurt. Aspartame (E951) is widely used in South Africa. On the label of a 300 ml can of “no sugar” Coca-Cola, the consumer is informed that it contains “non-nutritive sweeteners (aspartame and acesulfame-K)”, although the amount used is not specified.

In the USA, the Food and Drug Administration (FDA),⁷ and in Europe, the European Food Safety Authority (EFSA) have certified that the use of specified amounts of aspartame are safe for human consumption. Hence, food producers are permitted to add this to beverages and food. While these groups regard its use as not having significant health risks, other researchers are much more critical. For example, Millstone and Dawson (2019) critique the 2013 assessment of the safety of aspartame by the EFSA, because it discounted the many scientific studies indicating that it could cause cancer, cardiovascular problems, migraine, and several neurological problems.

5.3.4 The use of monosodium glutamate (MSG) as an additive

Many processed food products contain MSG. It is added to certain flavourants, soy sauce, meat stocks, protein fortified foodstuffs, corn starch, salad dressings, packet soup, frozen food, and powdered milk. MSG is also used extensively in some Chinese restaurants. In addition, many restaurants use processed sauces that contain MSG (E621) and some butchers add it to meat products to give them a brighter pink/red colour. Often products such as crisps/chips state “no added MSG”, but the product label states that colourants and flavourants (or flavourings) are added – and these often include MSG. Certain products, such as Aromat, are mainly composed of MSG, along with other additives, such as salt, flavourants, artificially hydrogenated vegetable fat, anticaking agent (E551), and flavour enhancers (E631, E627). Identifying the use of MSG is made more difficult, as it is also labelled as glutamate, monopotassium glutamate, monosodium glutamate, sodium caseinate, yeast nutrient, and so on.

Chemically, MSG is approximately 80% free glutamic acid and 20% sodium. In its natural form, it is the flavour-enhancing substance contained in seaweed. However, the manufactured rather than the natural version is added to processed food, which is problematic.

The FDA considers the addition of MSG to foods to be “generally recognized as safe” (GRAS). According to the FDA (2021:n.d.),

Over the years, FDA has received reports of symptoms such as headache and nausea after eating foods containing MSG. However, we were never able to confirm that the MSG caused the reported effects.

However, Minich (2009:142-143) states that MSG, along with several other additives “may provoke allergies like asthma, breathing difficulties,

7 Confusingly, in the USA, the word “drug” means medicine.

fatigue, headaches, increased heart rate, migraines, and skin reactions”. More recently, other researchers are also critical of MSG, stating:

The adverse effects of MSG include headaches, serious allergic reactions, nausea, chest pains with heart attack-like symptoms, brain edema, weakness, and so forth. Use of MSG increases the chances of reproductive dysfunction in both females and males (Grumezescu & Holban 2018:8).

5.3.5 Dyes and colourants

Chemical additives such as specific colourants add no nutritional value to food and researchers have highlighted their dangers. Colourants in the form of different azo dyes are widely used, including Tartrazine (E102), Sunset Yellow (E110) and Allura Red (E129). “Azo dyes account for approximately 60-70% of all dyes used in food and textile manufacture” (Food Info Foundation 2017).

Cannon (1986:1275) drew attention to research that argued that the azo dyes used in food were toxic and had negative effects on children, such as hyperactivity. Since then, numerous books and articles have been published, either supporting (Cheeseman 2012:A15-A16) or negating (Watson 2008:687) this view. Fruit drinks may appear to be healthy, but they are sometimes coloured with additives that cause allergic reactions.

The most common food additives that may cause sensitivity reactions include aspartame, benzoates, BHA and BHT, FD and C dyes Yellow no. 5 and Red No. 3, monosodium glutamate (MSG), nitrates/nitrites, parabens and sulfites (Winter 2004:27).

It is interesting to note that, since 2009, the global producer Nestlé has responded to parents’ concerns and has increasingly replaced synthetic with “natural” dyes, for example, in chocolate Smarties (Schwarcz 2010). However, the South African maize snack, NikNaks, remains popular. According to its label, it contains several additives, including E508 (potassium chloride), MSG (E621), and a number of anticaking agents, colourants (E110 – Sunset Yellow, E124 – Ponceau 4R/Cochineal, and E160c – Capsanthian/Capsorubin) and flavour enhancers.

5.3.6 Sodium sulphites

Sodium sulphites (or sulphites) occur naturally in wine when it ferments, but they may not be used on fresh vegetables and fruits. However, they are used, for example, in bottled drinks, dried apricots, pizza dough, pickled onions, fruit toppings, and snack foods.

Many people experience adverse reactions to sulphite additives. Winter (2004:489) notes that “[r]eactions to sulphites can include acute asthma attacks, loss of consciousness, anaphylactic shock, diarrhea, and nausea”. Minich (2009:44) states that sulphites can “become cancer agents”. Two recent researchers report:

Many individuals are sensitive to sulphite additives and may experience a range of symptoms, including dermatological, gastrointestinal and respiratory symptoms. Nevertheless, reactions manifesting in the respiratory tract account for the majority of cases of sulphite sensitivity (Vally & Misso 2012:20).

In conclusion, there are growing concerns about the use of chemical additives. Many researchers have registered concerns about the massive changes in the way in which food is processed.

6. THEOLOGICAL-ETHICAL CONCERNS AND RECOMMENDATIONS

What contribution can Christians, along with others, make to this debate? Secular scientists and scholars who do not espouse a religious world view, many of whom are quoted above, have made a valuable contribution to the debates on the production and processing of food. Christian ethicists can draw on their research and insights in accordance with a natural law approach, as suggested by Aquinas and Biggar (2011:26-29; Kretzschmar 2018:116).⁸ Using reason, though marred by sin, and empirical research, different researchers can investigate the health and other effects of additives.

Several ethical criteria are employed below to evaluate the use of harmful additives. To begin with, perceptions of creation, generally, and of food, in particular, are considered, and moral norms such as “do no harm” (non-maleficence), and beneficence (actively do what is good and right for the benefit of others) are applied. In addition, the importance of moral values such as trust, respecting human rights and justice in food processing are considered. Furthermore, an assessment is made of the behaviour of those individuals and companies who knowingly manufacture harmful food additives and/or add them to processed food. Which of these criteria, it may be asked, are specifically Christian?

8 This is not to say that Christians will accept secular and materialist world views. These have been criticised by theologians (Biggar 1997:5-7; Haught 2008:15-27; Kretzschmar 2016:193-197; 2018:117-129).

In speaking of the integrity of creation rather than “nature”, Christian ethicists stress a God-created and -centred universe. Thus, Gustafson (1981:333, 338, 339) proposes a theocentric ethic, in which moral discernment is needed to discern the will of God. Moreover, Biggar (2011:7-9, 110) stresses the importance of the inclusion of Christian doctrines and insights in applied ethics and public debate.

A concern for the ethics of health and the moral value of trust is not restricted to Christian ethics. However, a dialogue between Christian and other thinkers about the link between food, worship, relationship, and community is important, because it rejects individualism and a purely material understanding of the human person and community. Similarly, Christians are not the only ones who speak of social and environmental justice. However, they can draw on a long tradition of Christian social ethics when evaluating vested interests, and the role of governments and health agencies. Finally, as Christians believe that human beings are created in the image of God, they have more reason than most to seek to uphold these rights.

6.1 The issue of the integrity of creation

In the early chapters of Genesis, the phrase “and God saw that it was good” is repeated several times (Gen. 1:10, 12, 18, 21, 25). Surely, food cannot be regarded as “good” if some foodstuffs are being contaminated by unnecessary and/or unhealthy additives. In the earlier description of food in the Bible, its theological meaning was highlighted, namely that food is a gift of God and intended for sustenance, celebration, relationships, and community in a context of social and environmental justice.

In theological discourse, the phrase “integrity of creation” refers not only to the need to resist environmental damage, but also gives

a new prominence to the doctrine of creation and the opportunity to re-affirm our Trinitarian faith, beginning with God as Creator and therefore also Liberator and Sustainer (Niles 2003).

A belief in the integrity of creation can be contrasted with an industrialised dominance over and alienation from nature. Rather than displaying an attitude of humility in the task of “earth-keeping”, some elements of food production exhibit a ruthless manipulation of food. Thus, while Gopalan (2001:1214) does not use the term “creation”, he critiques the view that “nature is a competitor to be overcome” and emphasises the need for environmental sustainability and organic farming, together with the production of healthy food. As God’s stewards of creation, the integrity of the food we eat, and its purposes of health and healing are vitally important (Conradie 2015:16).

This means that we need to ask what would constitute a moral vision for the processing of food, not only for human beings, but also for animals. A key part of such a vision would be to identify what has gone wrong in the production and processing of food. Food science simply cannot be left to the chemists, manufacturers, and industrialists; members of the health professions and informed citizens, including Christians, need to be more proactive in ensuring that food is healthy.

6.2 Health, food safety and trust

The earlier discussion revealed that, although not all additives are harmful, certain widely used additives can and do have a negative effect on our health. This is a violation of the moral norm of trust; public trust in processed food is thus decreasing.

The period of public crises (1980–2000) included concerns about unnecessary use of food additives, the impact of pesticides, weak microbiological standards (particularly for food-borne pathogens), limited labelling and the role of diet in degenerative diseases such as heart disease, diabetes and some cancers. Consumer scepticism is rife (Lang 2004:13).

Also of importance is the amount of additives consumed by unsuspecting consumers, and their cumulative effect. By 2009, it was calculated that the average American (in the USA)

consumes about 150 pounds [68 kgs] of food additives a year, the bulk of it sugar and sweeteners, followed by salt, vitamins, flavors, colorings, and preservatives, representing almost 10 percent of the food we eat each year (Minich 2009:10).

Even if a specified amount of an additive is regarded as an acceptable daily intake (ADI), who is calculating the cumulative effect of multiple additives? If some additives are neither nutritious nor healthy, are those individuals who add them to food not acting contrary to the health and well-being of consumers, and thus guilty of maleficence? This constitutes a significant abuse of public trust.

6.3 Vested interests and gaining inappropriate profits

Researchers have shown that powerful food companies have a vested interest in defending their use of additives and their production of processed food. For example, a study of the role corporations played in influencing the taxation of sugar-sweetened beverages (SSB) in South Africa concluded:

Our research raises fundamental questions concerning the bona fides of industry information in the context of government efforts to combat diet-related diseases. The beverage industry's claims against SSB taxation rest on a complex interplay of techniques, that appear to be grounded in evidence, but which do not observe widely accepted approaches to the use of either scientific or economic evidence (Fooks *et al.* 2019:1).

In addition, Mialon *et al.* (2020) investigated corporate political activity on the part of food companies in South Africa. They reported:

Food industry actors in South Africa established multiple relationships with various parties in and outside the South African government. ... Moreover, food industry actors [who] influenced science were directly involved in policy-making and helped frame the debate on diet and public health in South Africa (Mialon *et al.* 2020:n.p.).

The question must be asked: Who benefits from the large-scale production and processing of food? In the case of the sugar industry, habits of consumption are encouraged, and such companies benefit financially (and workers retain their jobs), but the health of the public is endangered.

The World Health Organization's Cancer Report (WHO, 2003) expects a steep rise in cancers in part due to poor diets – eating too much fat and not enough fruits and vegetables. There are no incentives for processors to sell only simple foods: for example, value-added fruit juices (lots of water plus a little fruit) make more money (Lang 2004:13).

The moral issue is not simply about the earning of profit; it is whether money can be earned legitimately if certain foods are non-nutritious and/or harmful. With regard to additives, while natural food cannot be patented, chemically altered and processed food additives can be patented, and large amounts of money can be made from such patents (Winter 2004:2). Both the companies that produce the additives and those that add them to processed food benefit financially, as consumers keep buying what tastes good to them. However, it is unethical to make money out of non-nutritious and harmful food additives.

6.4 Role of government authorities, including health agencies

Probably the largest government agency is the FDA in the USA, and many assume that the food they eat has been rigorously tested. However, the FDA often resorts to using the acronym GRAS, which means “generally recognized as safe”. Commentators point out that this provides a loophole that undermines the function of the FDA's oversight because

chemical manufacturers can decide for themselves if the product they've created is safe to consume. Their safety assessments don't have to be reviewed or approved by anyone else, and often manufacturers don't even have to disclose the name of the additive, or how it's used, to the FDA or to the public (Lehner 2014).⁹

South African regulations relating to additives in foodstuffs date back to the Foodstuffs, Cosmetics and Disinfectants Act, No. 54 of 1972. In South Africa, several government departments are responsible for food safety and Food Acts. The most recent on additives was promulgated in 2017 (Republic of South Africa 2019).

However, there are still challenges caused by the fragmentation of control, lack of coordination when implementing regulations and capacity constraints to ensure compliance (Sikuka 2019).

In addition, South African authorities accept regulations devised elsewhere, including the General Standard for Food Additives (GSFA) of the *Codex Alimentarius*, adopted by the Food and Agriculture Organization of the United Nations (2019). However, these regulations are open to criticism, as hundreds of "acceptable" additives are listed, including the trans fats, sugar, sweeteners, monosodium glutamate, colourings/dyes and sulphites discussed earlier. They are permitted to be used in specified amounts or restricted only by Good Manufacturing Practice (GMP). While regulatory systems exist for pharmaceuticals and some food (Good Manufacturing Practice (GMP) Resources 2021), we may ask whether these are adequate. Further, have health agencies been compromised by their close connection with large companies? If the current regulations are valid, why have so many health and other researchers questioned them, raising "reasonable doubts"?

After the listeriosis outbreak in South Africa (2017-2018), due to tainted meat products, South Africans became more aware of food safety. However, it is doubtful whether our awareness of harmful additives is adequate. If harm is being caused, as many argue, food companies and health agencies are morally guilty of maleficence. Kotzé's (2016:5-6) use of the theological-ethical notion of collective sin is relevant in this instance, because a collective sin is not restricted to the actions of an individual, but is social, communal, and structural. If government and health authorities are not independently minded (free from vested interests), conscientious and well-informed, they could use their positions of influence to wrongly advise members of the public. If so, they should not retain their remunerative positions.

9 Sarjeant & Evans (1999:viii-xvi, 133-141) report the difficulties they had in Canada when they sought to expose the dangers of additives, particularly on the bodies of women and children, to the authorities.

6.5 Knowledge, public awareness, and social justice

Widespread ignorance of food additives means that consumers are largely unaware of the degree of tampering that occurs with the processed food that they eat and are, therefore, not in a position to place food producers under pressure. This is especially true when conflicting assessments of food safety are provided. Even if consumers do read the labels of packaged food (bearing in mind that many food items are not labelled), the complexity of the chemistry of additives may not be fully understood.

Store shelves are laden with thousands of words waiting to be deciphered, and hundreds of new ones are piled on every year. This language, spoken on volumes of food labels, is speckled with infamous “unpronounceables” – long, polysyllabic, knotty, chemical-ized names of additives that have made their way into our everyday eating (Minich 2009:9).

Another relevant ethical value is that of justice. If consumers are not properly informed about the contents of what they purchase and consume, in terms that are fully understandable, an injustice is being done to those who unknowingly consume what may be harmful to them. Arguably, a form of deception is being perpetrated when complex chemical terms not easily understood by the public are provided on the labels of packaged foods.

Reason is an important formative factor in theology. Theological ethicists have long emphasised the need for knowledge and reasoning in ethical decision-making. Yet sound decisions cannot be made when knowledge is not presented in language that ordinary consumers can understand. Everts *et al.* (2018:171-184) advise that the public “negotiate risk” and make better food choices, using the criteria of price, taste, quality, and ethics. However, what is the price of health? How can taste be accurately measured when “taste enhancers” are used? How can the quality of the nutrition be assured by consumers? If those responsible for processing food are not acting in an ethical manner, they are morally culpable.

A further moral norm is that of human rights, and specifically the right to health. According to the first part of Article 25(1) of the 1948 Universal Declaration of Human Rights,

[e]veryone has the right to a standard of living adequate for *the health and well-being of himself and of his family, including food* (United Nations 1948, my emphasis).

Contrary to this Declaration, the inherent value of the food many consume is being compromised.

7. SUMMARY AND CONCLUDING RECOMMENDATIONS

At the outset of this paper, reference was made to the importance of food and the all too common “degraded understanding of the meaning of food”. “Fast”, highly processed, and convenient food has increasingly replaced natural food, and its poor nutritional value results in obesity, malnutrition, and a host of other health issues.

The above analysis has shown that the ever-increasing use of additives, many of which researchers have adjudged to be harmful, put at risk the health of consumers. Specifically, additives such as trans fats, sugar, aspartame, MSG, specific dyes and colourants, and sodium sulphites were shown to be problematic. At the very least, harmful additives can exacerbate the risk of migraine, neurological problems, diabetes, heart attacks, high blood pressure, nausea, inflammatory bowel disease, fatigue, asthma, reproductive dysfunction, as well as breast, colon and prostate cancer. If this is so, their use is not harmless, but injurious.

Therefore, Christians need to revive a biblical emphasis on food as a gift of God intended for sustenance, celebration, and community-building. Food production and consumption includes but extends beyond satisfying the pangs of hunger. It involves meaningful work, an appreciation of God’s grace and life-affirming relationships. This faith perspective is both deeper and richer than a secular, materialist, or consumerist perspective.

Whereas the Jewish and Muslim faiths retain food laws to ascertain which foods can be consumed, Christians have largely abandoned them. This does not mean that specific food laws need to be devised, but Christians certainly need to become much more knowledgeable about what they are consuming. Christian theologians, pastors and lay leaders need to question and expose those vested interests that compromise food safety and food security by failing to clearly reveal the negative effects of highly processed food which include a host of additives.

Public trust and social justice are vital to community well-being. Similarly, environmental sustainability can be advanced by significantly reducing the long-distance transportation of food and those forms of agriculture that pollute or deplete the earth’s natural resources.

Based on these conclusions, four recommendations can be made. First, the need to *become aware* of what we are consuming, because ignorance and moral inertia constitute significant health risks. Do members of the public realise how many supermarket aisles are dedicated to processed as opposed to natural food?

Secondly, to become adept at *reading food labels*. Consumers need to develop a growing understanding of what they state (and fail to state). Significantly, the subtitle of Minich’s book is *Never eat what you can’t pronounce*.

Thirdly, to consume mainly nutritious and unprocessed food.

The best rule of thumb is to keep your foods *simple* – whole, unprocessed foods in their natural state are ideal and highly recommended (Minich 2009:15).

Fourthly, to be proactive. Interestingly, Gopalan (2001:1207) argues that in seeking to make “food production and consumption more sustainable”, the role of women needs to be considered, because “women play a major role in the food production and consumption”. Even on small plots of land, or in plant containers (including discarded car tyres), families can develop vegetable gardens to supply some natural food needs. This can not only provide vital vitamins and other nutritional needs, but also save the family money.

In essence, natural, organically produced food, uncontaminated by harmful additives, ought to be eaten by well-informed members of the public, and intense pressure should be placed on food processors to be more transparent about their products. This will meet the moral requirements of environmental and social justice and protect the health and well-being of communities.

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