

Less is more

The WHO determined that processed meats like bacon raise the risk of colorectal cancer

Sustainable-minded consumers – especially the demographic group Millennials born between 1982 and 2004 – are cutting back on meat due to perceived health and animal welfare concerns. To make matters worse, the global meat industry is forced to go on the defensive and are now contemplating whether or not to proactively react to the high profile study by the WHO's International Agency for Research on Cancer. However, when everything is said and done, the WHO's conclusions need to be taken with a grain of salt.

By Henk Hoogenkamp

According to an international panel of experts from the World Health Organization (WHO) eating processed meat products like bacon and ham raises the risk of colorectal cancer (WHO, 26 October, 2015). Colorectal cancer is the third-most commonly diagnosed cancer among men and women in the US.

It should be pointed out that the IARC – a research arm of the WHO – classifications describe the strength of the scientific evidence about a compound or substance being a cause of cancer, rather than assessing the level of risk. Certainly not all identified agents are associated with cancer to the same extent.

Processed meats are defined products that have been cured by nitrite, smoked and/or fermented, generating chemical compounds that are (suspected) carcinogens. The art of meat processing is almost as old as mankind and over a great many centuries meat has been transformed by means of salting, saltpeter/nitrite curing, fermentation and wood smoking to improve organoleptic quality such as preservation, fixing colour and enhance flavour. In the study the International Agency Research on Cancer (IARC) concluded that each 50-g portion of processed meat eaten daily increases an individual's risk of colorectal cancer by 18%.

Of more serious concern is cooking at high temperatures – such as BBQ – with the meat in direct contact with flames that may cause certain types of carcinogens, especially when overcooked showing heavy blackened spots and crusts.

The panel's conclusions are based primarily on epidemiological studies linking what people ate with cancers they developed later. In addition it should be noted that the expert panel failed to reach a unanimous consensus reflecting sharp differences of opinions. Of the 22 members who voted on its conclusions, seven either disagreed or chose to abstain voting.

The absolute risk of eating processed meats is very low and it is estimated that diets high of these types of products cause about 30,000 cancer deaths globally, through the true number could also be far less.

This number is in sharp contrast with tobacco smoking that causes about one million cancer deaths a year worldwide, and some 600,000 deaths associated with alcohol consumption. Hence, it is important for these official Government Agencies not to terrorise people into thinking that they should not eat any red meat. Not eating processed meat in moderation would be an exaggeration. There is still a lot of uncertainty, especially if one considers external environ-

mental and lifestyle factors that may contribute also to disease formation.

Ever since the end of World War 2, the role of meat in the



Consumers seek out for minimally processed products containing "natural" ingredients.

American diet has changed dramatically: from a supporting role eaten in small portion sizes to the super-size portions at ever-increasing frequency of consumption. There indeed seems to be a correlation in the diagnosis of colorectal cancer and the quantity of meat eaten. The verdict is still out, but it seems that high levels of iron as well as the gut microbiota is the main target subject of study among biomedical professionals. Especially heme-induced epithelial damage that leads to intestinal cytotoxicity is associated with cancer development. In particular the cofactor heme – that gives red meat its colour – is poorly absorbed in the small intestine that potentially can penetrate the gut's protective mucus layer.

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Hams can be enjoyed when eaten in moderation.

It is disappointing that IARC's announcement is done in a dramatic and alarming manner and opting to rely on reviews of existing literature and drawing conclusions without establishing a causal linkage between processed meat and cancer. It is also misleading not to highlight the nutritional value of red meat and processed meat products as part of a balanced and healthy diet and lifestyle. Meat is very nutrient dense and contains high quality protein, essential amino acids, peptides, as well as thiamin (Vitamin B1), riboflavin (B2), niacin (B3), B6 and B12.

Meat and meat products can be enjoyed when eaten in moderation and it is wrong to unsettle people when comparing eating meat on the same platform as asbestos, alcohol and smoking. Increasing number of modern consumers and especially Millennials (born 1982–2004) seek out foods that are minimally processed containing natural ingredients without preservatives. Millennials are less concerned about calories and fat and this powerful demographic group uses technology and social media as a tool to reach their health goals.

Sodium: less is healthy

High sodium intake can be considered a key component of diet

that is related to high blood pressure and its many subsequent medical conditions. There has been a profound change around the world in risk factors associated with death since 1990. Back then the biggest risk factors were child and maternal malnutrition, unsafe water and sanitation. However, in 2015 the situation has changed drastically and at the global level the most important contributors to the overall burden of diet are the consumption of high sugar, low fruit, low vegetables, low whole grains, high sodium, and low nuts and seeds.

Women in both developed and developing countries often are faced with high BMI, a condition that has become a leading risk factor in premature death. For men, high blood pressure and/or tobacco use or alcohol is the leading risk factor.

There is convincing evidence that there is an association between salt intake and income and educational status. Typically, people of low-income background eat more salt than those on higher incomes and subsequently can contribute to lower life expectancy. The health benefits of lower salt foods have not reached those who need it most. Perhaps the only way to stop unhealthy salty junk food is for Governments to interfere and man-

date specific salt levels for certain food or food categories.

Dietary sodium reduction is important for those with hypertension, heart conditions, and certain types of kidney and liver ailments. In addition, certain ethnic groups and older people might also want to restrict salt intake. Most people consume far more than the 5 g per day recommended by the WHO. An average intake of 8 g to 12 g is quite normal in Western countries – an amount that has not changed in a decade.

In the US, more than 90% of 6–18 year old children eat more sodium than recommended, putting them at risk for developing high blood pressure and heart disease later in life (CDC Vital Signs report, September 2014). These children eat an average of about 3,300 mg of sodium a day – not counting the salt shaker – while the official dietary guidelines for Americans recommend that children eat less than 2,300 mg per day in total.

Most of the children's salt intake comes from pizza, chicken foods, savory snacks, cheese, soups and ethnic mixed dishes. It is important to switch to healthier options using less sodium and sugar. Instead increase the consumption of whole grains, fruits and vegetables, while a moderation in lean muscle- and dairy protein. Easy and rapidly diges-

ting sources of plant protein can balance out optimum levels of protein intake.

Monitoring salt

On a molecular weight basis, sodium chloride is 39.34 % sodium and 60.66% chloride. The Food and Drug Administration (FDA) standards allow regular table salt to contain up to 2% additives like anti-caking agents and processing aids. From a government point of view, regulating salt is more complicated than it might seem. Many traditional foods such as pickles have high salt levels, which will make mandatory federal standards difficult to implement. Most probably, a voluntary initiative to reduce sodium is the smart way forward.

Policy makers tend to take a precautionary approach to recommend reduced sodium intake across the population, not just for the at-risk or subgroups. Besides improving hypertension, there are downsides of cutting salt intake: it also tends to increase levels of cholesterol, triglycerides, and hormones. For healthy people, salt reduction might indeed be a double-edged sword. To be on the safe side, there is evidence that population-wide salt reduction may be associated with lower incidence of heart disease and stroke. For now, the sodium reduction debate among academics continues.

The effects of increasing sodium intake on raising blood pressure become worse as intake rises above 5 g per day, especially among people who already have high blood pressure or who are older than 55. While there has been much focus on reducing salt intake, an important and often ignored approach to lower blood pressure is increasing the amount of potassium consumed. Moderation and a balanced approach is likely to have the greatest benefits in lowering blood pressure. This can be achieved by moderation in salt intake combined with eating fruits and vegetables.

However, it should be pointed out that too low sodium intake also has other associated effect, including adverse elevations of certain hormones that are associated with an increase in risk of death and cardiovascular diseases. The

lowest risk of death and cardiovascular events are those people who consumed moderate amounts of sodium intake – 3 to 6g per day – with an increased risk above and below that average (NEW ENGLAND JOURNAL OF MEDICINE, 14 August, 2014).

The current increase in diet-related diseases requires a repositioning of fat and sodium content in processed food, formulated soft drinks, and processed meats, which traditionally contain elevated levels of sodium. Unfortunately, sodium is closely intertwined with important sensory properties and functional benefits.

There is little doubt that eating many types of processed foods can be classified as junk food, consumption of which can become addictive. Salt and fat are especially pleasing to the mouthfeel. With the addition of crunch and sugar, it becomes hard to control compulsive eating.

The large amount of sodium in processed foods makes it almost impossible for consumers to cut back and reach the recommended 1,500 mg of sodium a day. The recommended amount of sodium is based on epidemiological data and studies that assessed the effects on blood pressure.

It is important to know that if teenagers reduce their often-excessive intake of sodium – over 3,800 mg a day and well over the 2,300 mg/day maximum limit –

their risk of having cardiovascular disease in adulthood can be significantly reduced. Hence, teenagers could have measurable benefits like reduction of heart attacks, coronary disease, stroke, and hypertension by the time they reach the age of 50.

Lifestyle sodium reduction

Salt is an important nutrient for the human body. Sodium, potassium, and calcium salts are essential for all nerve cell activity, muscle movement, as well as osmotic balance of the body fluids. Since the beginning of agriculture and farming, salt consumption has remained relatively stable over the last 8000 years. In the last 50 years, however, the use of salt has skyrocketed primarily due to the significant increase in the consumption of processed foods and meats.

Salt content is another front in the healthy food fight. Processed foods, not the saltshaker are obviously the source of most of the dietary salt consumed on a daily basis. An estimated 70% of total dietary sodium chloride (NaCl) intake comes from processed foods, such as canned soups, bread, snack foods, deli meats, cheese, condiments and – surprisingly – muffins and doughnuts. To be fair, sodium is not only added to boost flavour but also to improve texture and leavening.



Especially Millennials (born 1982–2004) look for „natural“ ingredients.

For years, it seemed that marketing low-sodium foods was a thing of the past, when suddenly low-sodium and reduced-sodium food re-appeared in the limelight. That change is partly due to the Centers for Disease Control and Prevention (CDC) and the Institute of Medicine, along with proactive food companies which have weighed in on the urgent need for sodium reduction.

Part of the problem is that salt provides important benefits for processed food manufacturers and meat processors. Salt is a cheap ingredient that is ideally suitable to extend shelf life. It also

enhances flavour, improves texture, and serves as an ideal masking agent for bitterness. In addition, many people would say no when asked if salt reduction or elimination means switching to an alternative synthetic or chemical additive.

Sodium intoxication

Hypertension – known as high blood pressure – affects more than one in three adults aged 25 and over worldwide. This equals about one billion people. Hypertension is one of the most important contributors to heart disease and stroke – together make up the number one cause of death and/or disability. Associated with hypertension are increased risks of developing kidney failure and blindness.

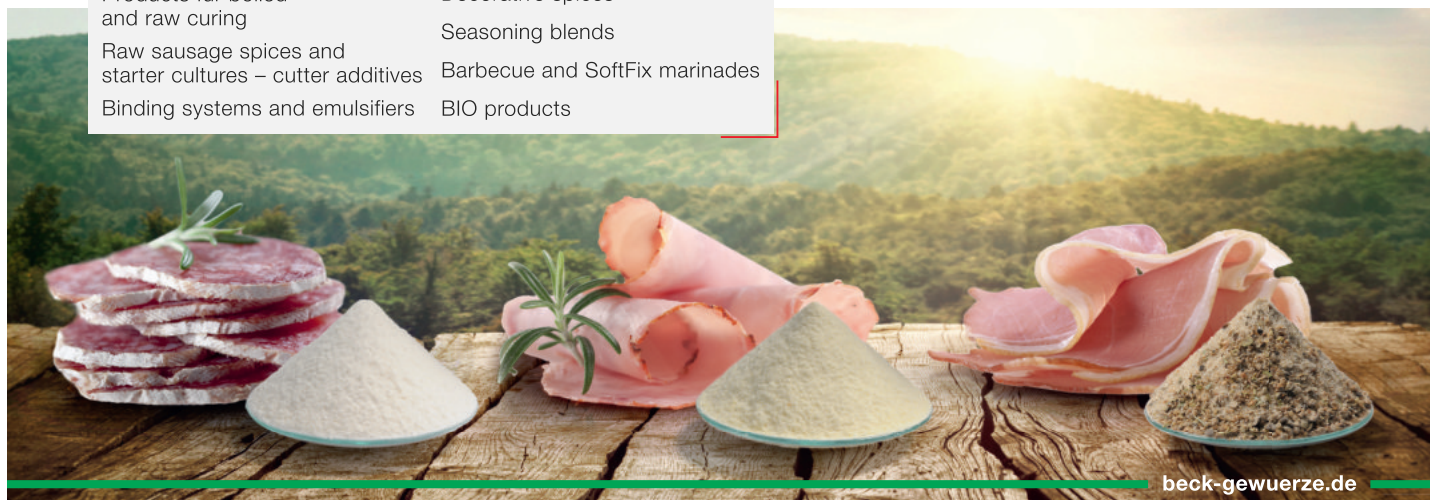
In the US approximately 80 mill. adults – one in three – have high blood pressure and half of those who seek medical treatment still have systolic pressure over 140. Systolic pressure is the higher of the two blood pressure numbers and represent pressure on blood vessels when the heart contracts. The most recent guidelines to bring down systolic blood pressure to below 120 – far lower than current guidelines of 140, or 150 for people over 60. The new guidelines will reduce the risk of heart attacks, heart failure and strokes by 33% and the risk of death by nearly 25%.

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Phosphates in hams are frequently used for technological reasons.

The risk of hypertension increases with age. It is estimated that one out of two people over the age of sixty suffers from high blood pressure. If the blood pressure of a resting person is 140/90 mmHg – or higher on two different occasions – this can then be classified as hypertension. The first number represents the systolic pressure or the blood that is pumped into the body (140 mmHg), and a diastolic pressure, the blood that is pumped back into the heart (90 mmHg). If hypertension is not treated, it can have serious conditions.

It is estimated that high blood pressure contributes to approximately 9.0 mill. deaths worldwide from cardiovascular disease each year. The prevalence of hypertension is highest in Africa (46% of adults) while the lowest prevalence is found in the Americas (35% of adults). In general, high-income people have a lower prevalence of hypertension than low-income groups. Obviously, these numbers are related to better access to healthcare.

For many people, hypertension is a form of chronic sodium intoxication. The hypertension disease afflicts about 80 mill. Americans, of which some two-thirds are over the age of 60. Aging and hypertension seemingly go hand-in-hand, but it does not have to be that way. It is a fact that consuming too much sodium raises blood pressure, which ultimately triggers stroke and heart attacks. In the US this form of “sodium intoxication” is killing between 50,000 and 90,000 people per year, not to mention the huge related medical costs

for people on kidney dialysis and stroke rehabilitation care centers.

Renaissance potassium

Several factors are correlated with the reduction of blood pressure following increased potassium supplementation. Preferably increased potassium fortification intake via whole food coupled with salt (sodium chloride) reduction to reach benefits of an optimum sodium/potassium balance. Increasing potassium intake can be obtained by selecting foods like vegetables, fruits (bananas) and nuts.

Dietary potassium intake will not only delay potassium towards elevated blood pressure levels but also delay or defer the need for antihypertensive prescription drugs. The World Health Organization (WHO) recommends a daily potassium intake of a minimum of 3.5 g. The same organisation estimates about 25% or some 1.8 bn. people of the world population to suffer from hypertension.

Salt reduction in perspective

To put the discussion into perspective: There are physiological consequences to consider in consuming too little sodium. At decreased levels of intake, triglyceride levels increase as well as insulin resistance increase, and the activity of the sympathetic nervous system increases. All of these factors can also increase the risk of heart disease. It may be concluded that sodium reduction is

an issue about potential harm for subgroup populations, rather than a generalised recommended daily sodium intake.

The phosphate dialogue

Phosphates are frequently used for technological reasons – acidifying agents, acidity buffers, emulsifying agents, and intensifying flavour. Phosphate is present in many processed foods like soft spreadable cheese, meat products, beverages, canned and frozen vegetables and soups, as well as baked goods. Natural phosphate esters are also typically present in protein-rich foods like lean meat and are broken down slowly in the gut before being re-absorbed into the body.

The huge increase of processed food consumption has triggered the use of added phosphate and it is estimated to have doubled from 1980 to 2012 or just from below 500 mg a day to 1000 mg a day. Most food legislation rules do not require quantification, but simply identify the presence of phosphate or its E-number on the food label. According to the Department of Agriculture data from 2006, the average phosphate intake for American males and females over two years old is 1,334 mg. The Recommended Daily Allowance (RDA) is 1,250 mg for pre-teens and teenagers and 700 mg for adults, with a maximum tolerable level set at 4 g per day (Emory University, March 2010).

Phosphates that are added in inorganic form to foods like meat; dairy, bakery and cereals appear to cause higher spikes in blood phosphorous levels than naturally occurring (organic) phosphates. Too much phosphate is concerning to people who are healthy, but it is also of special concern to people who already have kidney damage or chronic renal disease. Typically, the most significant increase in blood phosphate levels occurs in people who eat dairy foods and cereal/grain-based foods that contain artificially (inorganic) added phosphate (AMERICAN JOURNAL OF CLINICAL NUTRITION, July 2015).

Research has indicated that elevated serum phosphate intake is possibly correlated with the mortality in people and may

cause organ calcification in renal (kidney) patients – a correlation between high blood phosphate and cardiovascular disease in healthy people (DEUTSCHES ÄRTZEBLATT INTERNATIONAL 2012).

In the processed meat industry worldwide, salt and phosphate are probably the most frequently-used additive in nearly all categories: emulsified, coarse, enhanced, and whole muscle meat products. Perhaps the time has come for the collective food and meat industry to label the presence of added salt and phosphate not only qualitatively but also quantitatively.

It is necessary to distinguish between natural (organic) phosphates and chemically derived phosphates. Natural or organic phosphates are mainly found in protein-rich foods such as meat, fish, eggs and dairy. These naturally occurring phosphates are slowly broken down in the gastrointestinal tract and subsequently re-absorbed gradually from the intestines. In a typical diet, about 50% of these organic phosphate esters are re-absorbed this way.

In contrast to organic phosphate, industrially processed foods have much higher levels of added (poly)phosphate to obtain certain product modulations and/or cost advantages. For example, chemically derived phosphates are used as preservatives, yield manipulating agents, acidity buffers, emulsifying support as well intensifying flavour and reducing warmed-over-flavour in cooked meat products. Phosphates are also frequently used as “melting salts” in spreadable and/or extended cheese.



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