

**NUTRITION TRANSITION AND  
DESTRUCTION OF LOCAL DIETS: WHY GM  
FOREIGN FOODS ARE NOT GOOD FOR US**

**Maurice M. Iwu, Ph.D.**

**BIORESOURCES DEVELOPMENT GROUP**

# Background

- Gratitude to the conveners of the conference for this timely meeting
- Remarkable cooperation between religious organizations, civil society groups and scientific institutions.
- This fits into the Exhortation by both Pope John Paul and Pope Benedict XVI that Africa should be:

- “I invite all people of goodwill to look to Africa with faith and love, to help it become – through Christ and through the Holy Spirit – the light of the world and the salt of the earth (cf. *Mt* 5:13-14).
- A precious treasure is to be found in the soul of Africa, where I perceive a “spiritual ‘lung’ for a humanity that appears to be in a crisis of faith and hope” – on account of the extraordinary human and spiritual riches of its children, its variegated cultures, its soil and sub-soil of abundant resources.”

## *References to the quotes*

1. Benedict XVI, Post – Synodal Apostolic Exhortation, *Africae Munus*. Africa's Commitment - Pauline Press. (2011) 9.
2. John Paul II, Post – Synodal Apostolic Exhortation, *Ecclesia in Africa* (14 September 1995), 63: AAS 88 (1996), 39-40.
3. Francis Pope (2015) Encyclical on the care of the earth.



*But to Western Media a  
Sustained Negative Campaign  
Against Africa is Good for  
Politics and Business*

**BOOKS**  
Our review after page 64

# The Economist

MAY 13TH - 19TH 2000

**COOLING  
THE ECONOMY**  
pages 19, 25 and 69

**BREAKTHROUGH  
IN ULSTER?**  
pages 18 and 55

## The hopeless continent



US\$3.95 • C\$4.95



Argentina... \$6.95  
Australia... \$6.95  
Brazil... \$6.95  
Canada... \$6.95  
France... \$6.95

Germany... \$6.95  
India... \$6.95  
Japan... \$6.95  
Mexico... \$6.95  
New Zealand... \$6.95

Peru... \$6.95  
Russia... \$6.95  
South Africa... \$6.95  
Spain... \$6.95  
Sweden... \$6.95

Switzerland... \$6.95  
Taiwan... \$6.95  
UK... \$6.95  
USA... \$6.95  
South Korea... \$6.95

# Nutrition Transition – From African Cuisine to Western Diet

- A rapid increase in the incidence of cancers, obesity and various endemic chronic diseases from ADHD, Alzheimer, and autism to osteoarthritis and stroke.
- Heart failure and metabolic diseases are now the leading causes of death in some countries.
- For several decades the epidemic was regarded as mainly a problem of the Western world, which was blamed on its modern agricultural techniques, mass production and easy access to and over consumption of agricultural foods, including many industrially manipulated and processed food such as meat, dairy and wheat.



- Similar disease patterns are now observed also in other parts of the world, largely in parallel to the adoption of a “modern” /Western lifestyle. African city dwellers who embrace the same lifestyles as their Western counterparts are in fact not only suffering from the same diseases as the people in the West but at far greater rate and intensity – **and at earlier age.**

- This epidemic of obesity (and its co-morbidities) with the epicenter in Southern United States, is now ravaging many parts of Africa, especially among the rich who no longer consume the bioprotective African ethnic foods in preference to the pro-inflammatory cuisine.
- In other words we are a society undergoing nutrition transition – from traditional African diet to Western food habits - and it is the effect of coping mechanism and cellular adjustments that our bodies are undergoing that manifest as diseases.

# Dangers of Foreign Foods

- ❑ Excessive levels of adhering pesticides, heavy metals and toxic chemical additives beyond the levels permitted in host countries.
- ❑ Transportation over long distance necessitates the use of preservatives most of which may be harmful
- ❑ Prolonged contact of the food with packaging materials at extremes of temperature causes migration or leaching of toxic chemicals such as the carcinogenic bisphenol A (BPA).
- ❑ Poor or absent food safety concerns for products for developing countries.

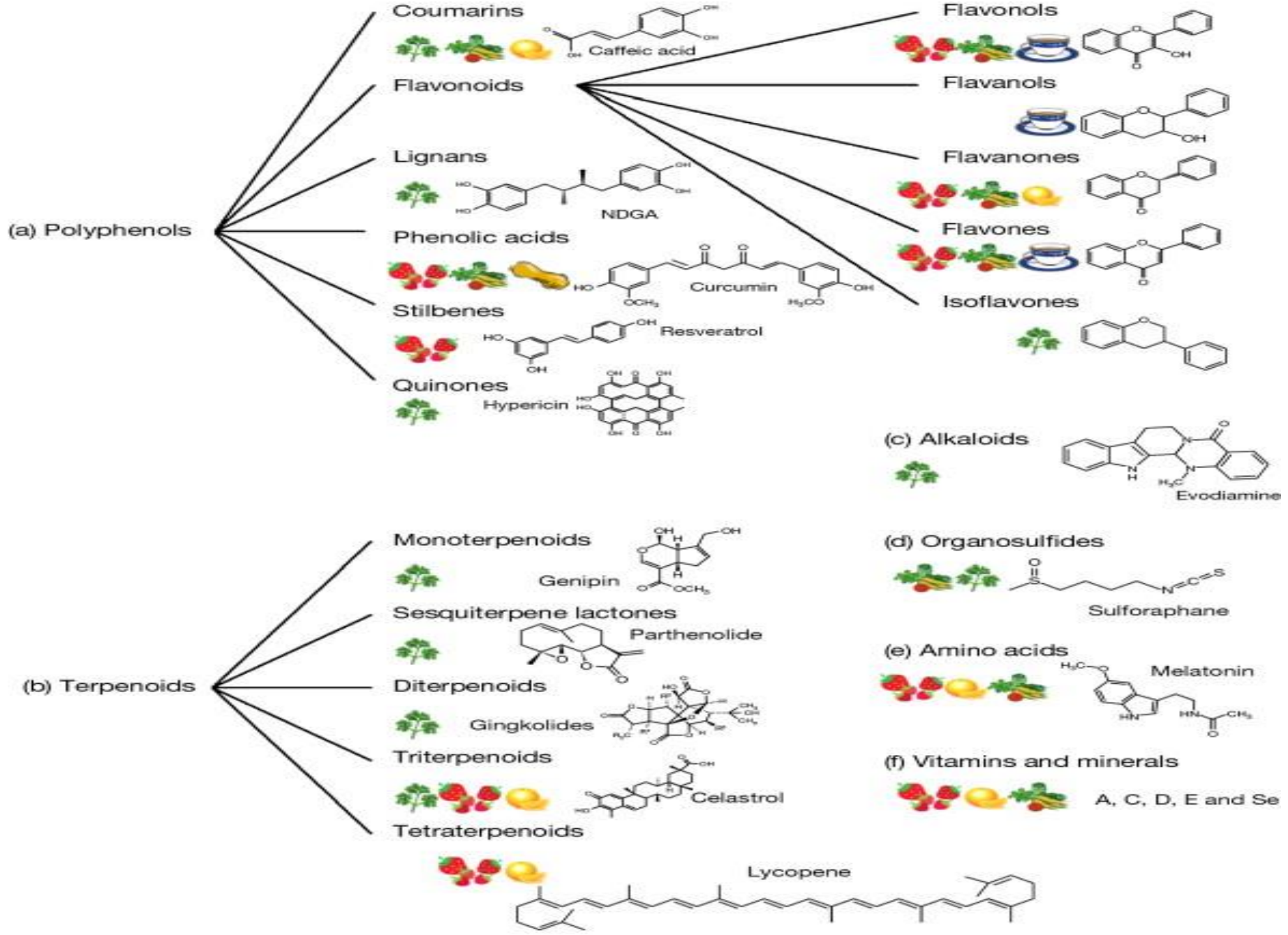
Plants, in addition to being rich in macronutrients (carbohydrates, proteins and fats), vitamins and minerals contain bioactive compounds that act as medicines at cellular levels to repair damaged tissues, restore normal physiological functions and enable the body to fight diseases.

Some of the compounds found in plants are not necessarily produced by them but are assimilated into their organs as constituents, which makes it possible for the same plant species grown under two different environments to contain different mix of biochemicals.

Plants contain non-nutritive plant-chemicals called ‘phytochemicals’, with protective or disease preventive properties, beneficial catalytic role in human metabolism, catabolism and anabolism.

The name ‘phytochemical’ denote plant chemicals found in plants, including herbs, vegetables, fruits, grains, nuts and other plant food substances.

They dynamically regulate the metabolic functions of proteins, enzymes, transporters, receptors, and signalling transduction proteins linked to various lifestyle-related diseases.



- A typical example of such ubiquitous but harmful chemical found in imported food and packaging materials is bisphenol A (BPA)

# BPA in Packaged Foods

- Canned foods especially beverages, fish and sea food, fruits and condiments contained high total concentrations of bisphenols (Baluka, S.A. and Rumbeiha, W.K. Food and Chemical Toxicology, 92: 58-63. 2016).

Food in plastic, glass, paper and Tetra Pak.  
Polycarbonate drinking bottles also contribute significantly to adults' BPA exposure



# BPA in Packaging Materials

- BPA can migrate from baby feeding bottles into milk causing epigenetic modifications.
- A study conducted in Nigeria found that five out of sixteen (31%) of the pure water samples investigated had BPA equivalents ranging from 124.2 to 1000.8 ng/L of water (Omoruyi *et al.*, 2014).
- Heated fast-foods wrapped in plastics and wax-papers are also sources of BPA in food.

# Adverse Effects of BPA from Packaging Materials – 1


- At higher doses BPA may cause organ failure, leukemia and severe weight loss while at low doses it may undermine the endocrine system that influences human development, metabolism and behavior.
- Interferes with the immune homeostatic functions thus compromising the ability of the immune system to fight infections (Carlisle et al., 2009).

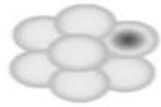
# Adverse Effects of BPA from Packaging Materials – 2

Causes abnormalities in reproductive organ function, irregular cycles, multiple ovarian cysts, reduction in primordial follicles, placental dysfunction, increased incidence of miscarriages, neonatal mortality, precocious puberty and affects the male reproductive system causing sexual dysfunction including decreased libido, erectile dysfunction, ejaculatory difficulties and abnormal semen parameters (Hunt *et al.*, 2009; Manfo *et al.*, 2014).

# Adverse Effects of BPA from Packaging Materials – 3

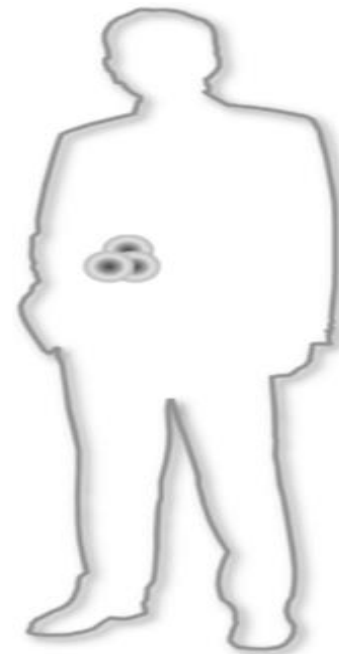
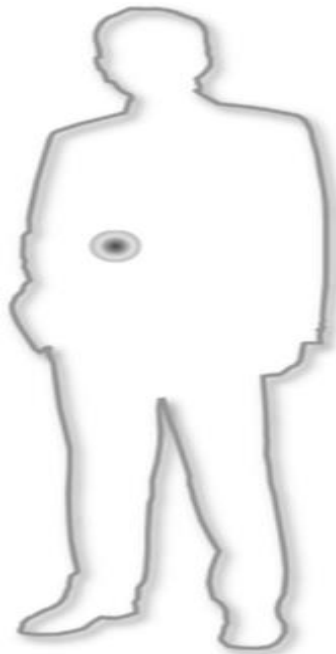
- Causes carcinogenesis of the prostate and breast (Castle, 2007; Marsh and Bugusu, 2007; Hunt *et al.*, 2009).
- Promote endocrine disruption, epigenetic modification, and cytokine release (Hunt *et al.*, 2009),
- Oxidative stress and inflammation which may lead to various diseases including cancer and cardiovascular disease particularly in immune compromised post-menopausal women (Yang *et al.*, 2009).

- 
- A major effect of BPA is the ability to cause epigenetic modifications which manifest as diseases later in life.



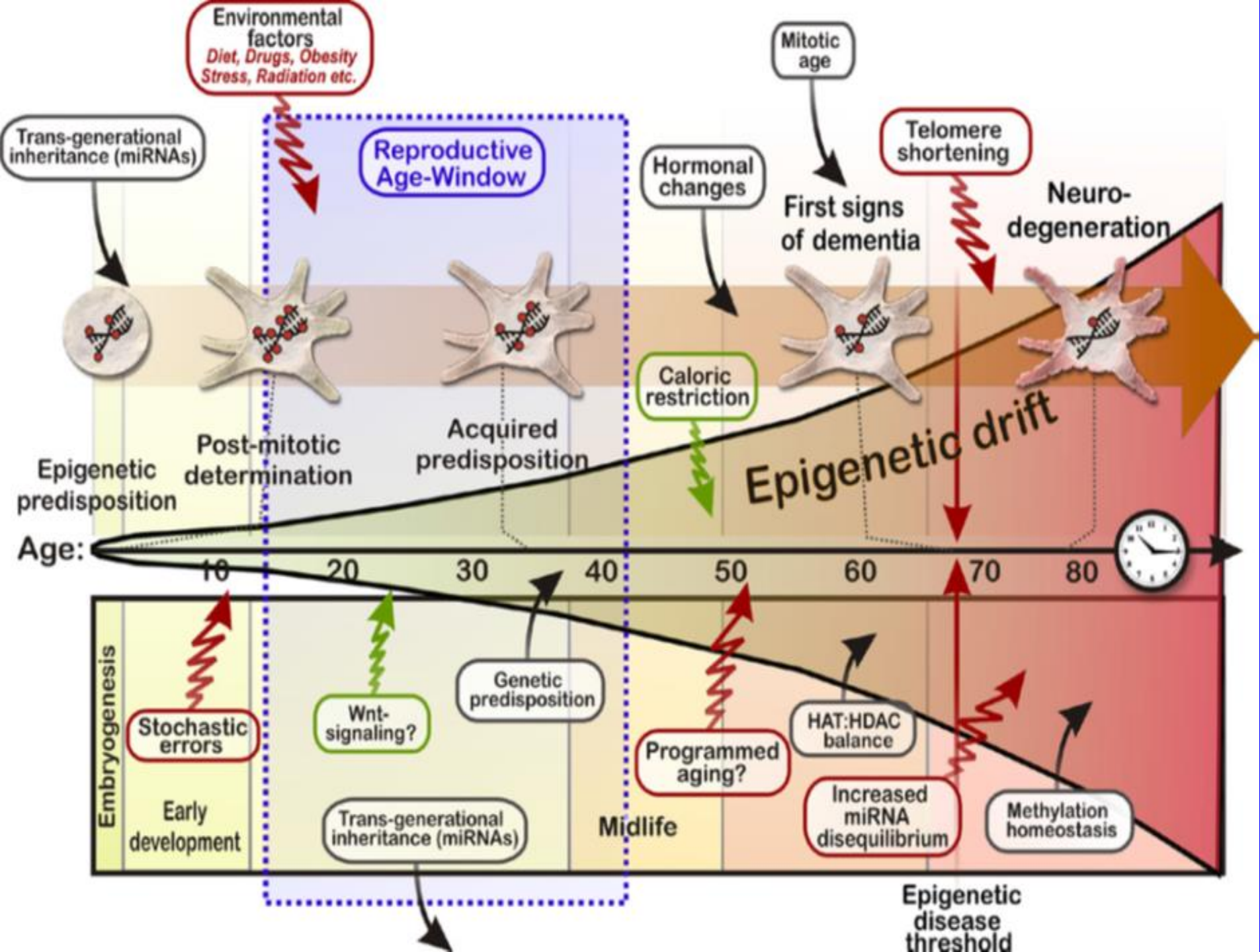
One epigenetically affected cell


20% epigenetically affected cells



One epigenetically affected cell

0.01% epigenetically affected cells



- 
- Imported foods are laden with added sugar which are disguised in many forms.
  - Contrary to the unscientific linkage between fatty acids and obesity, it is sugar and the difficult to distinguish HFCS that is largely responsible for obesity and the related diseases.



# Metabolic Syndrome

- World-wide increase in the rate of the incidence of obesity, type 2 diabetes mellitus (T2DM), hypertension, and metabolic syndrome (MetS).
- **Several studies have implicated increased consumption of calorie-rich/high-fat diet, lack of exercise, and sedentary lifestyles as some of the likely causes. But some scientists argue that increased consumption of a carbohydrate-rich diet with enhanced contents of sucrose, fructose, or glucose, or combination of all three in ready-to-eat foods is responsible for the increasing incidence of obesity, T2DM, and MetS.**

# Two Agents Targeted in Our Intervention

- Sugars – Especially Fructose in the form of High Fructose Corn Syrup (HFCS)
- Oxidative Stress and Pro-inflammatory agents from high gluten containing cereals such as wheat, barley and oats – all imported.

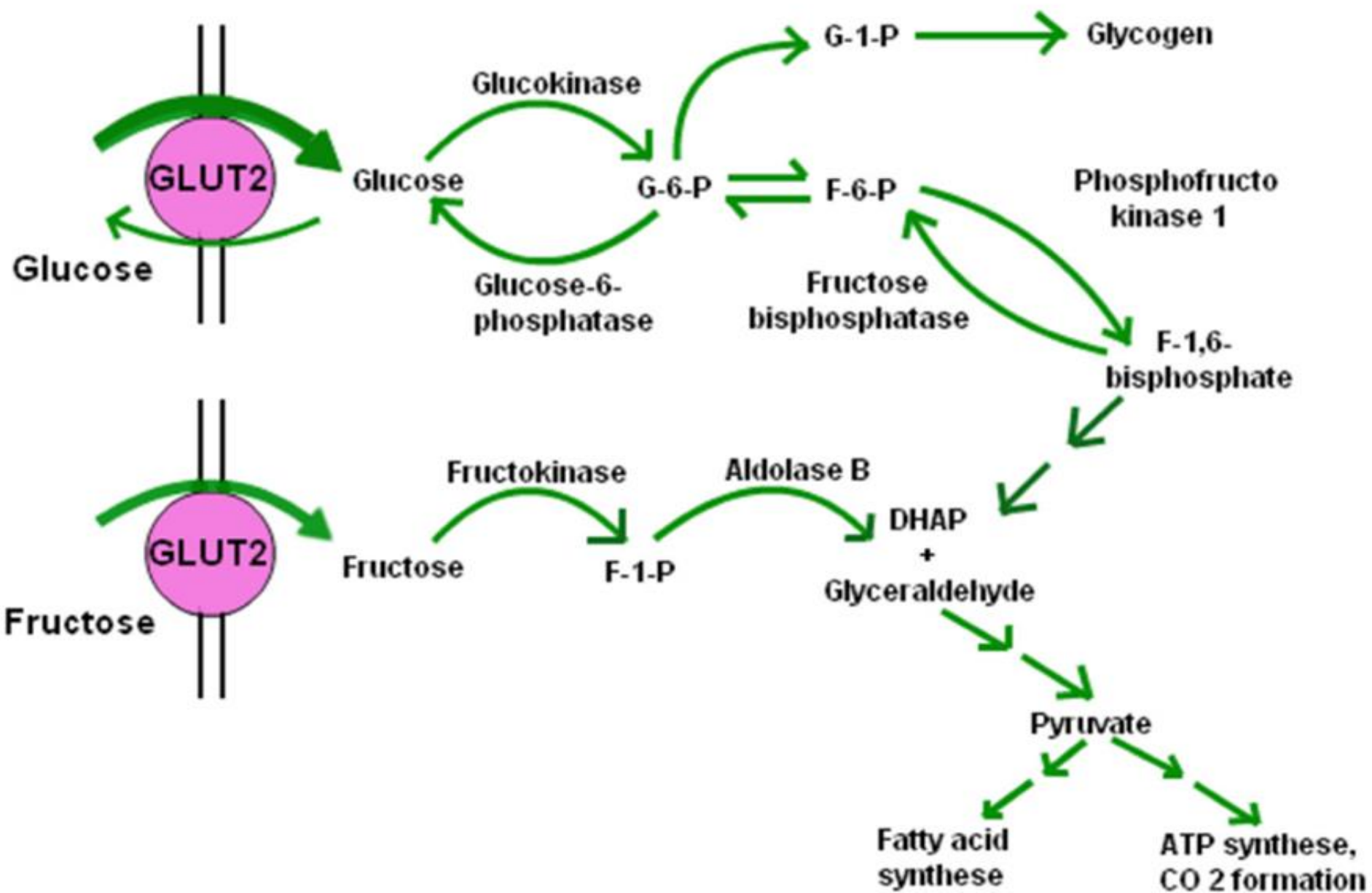
# Sucrose Vs HFCS

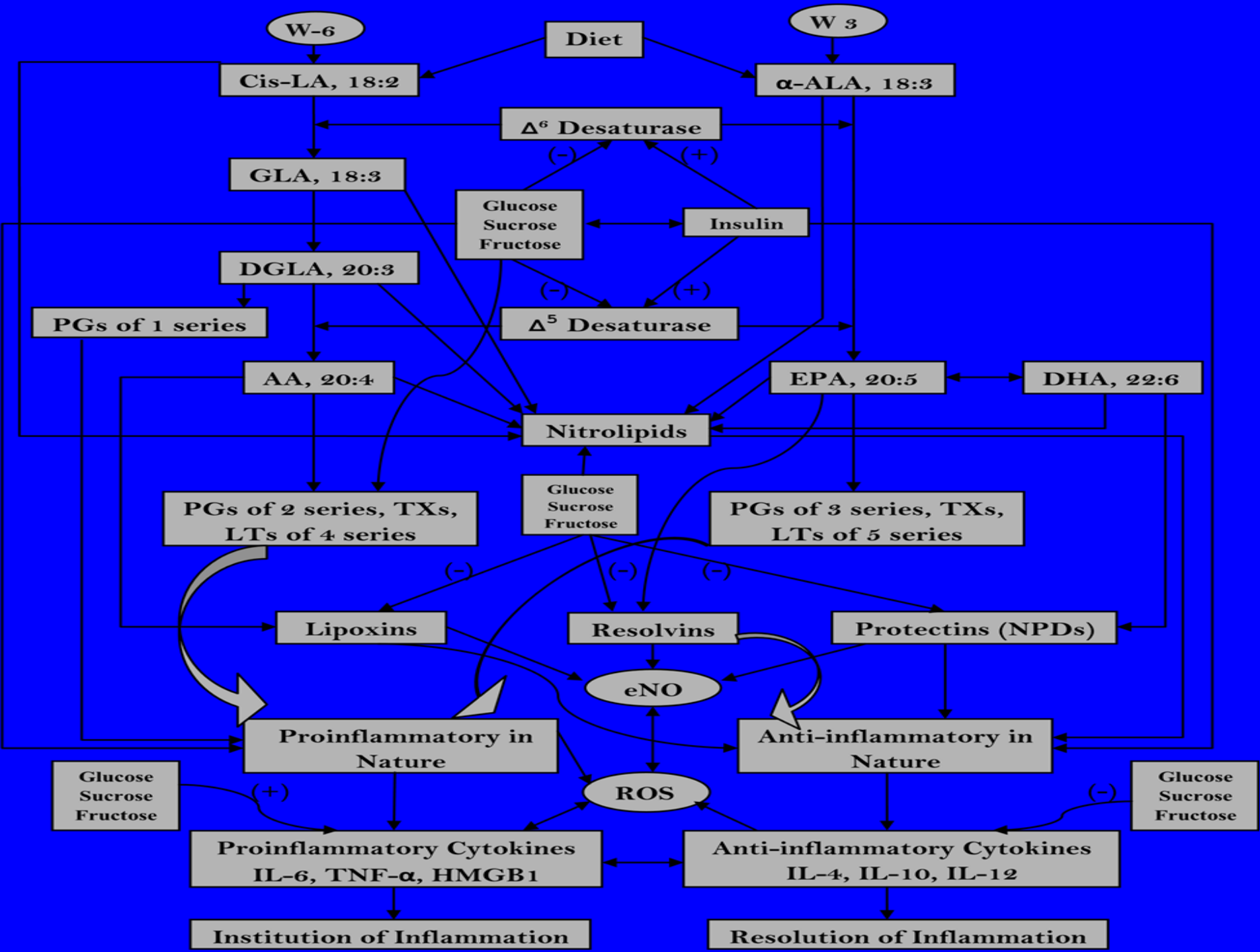
- Sucrose is composed of equal amounts of the two simple sugars ( i.e. 50 %t fructose and 50 % glucose) but the typical high-fructose corn syrup (HFCS -55) features an imbalanced ratio, containing 55 percent fructose and 42 percent glucose.
- Larger sugar molecules called higher saccharides (oligomers) make up the remaining 3 percent of the sweetener. Other varieties of HFCS available commercially are HFCS – 42 and HFCS – 90 (the numbers reflect the percentage of fructose they contain).

# Sucrose Vs HFCS - 2

- The fructose molecules in the HFCS sweetener are free and unbound, ready for absorption and utilization. In contrast, every fructose molecule in sucrose that comes from cane sugar or beet sugar is bound to a corresponding glucose molecule and must go through an extra metabolic step before it can be utilized.
- The two components of sucrose are metabolized differently .

# Hepatic Glucose and Fructose Metabolism After a Meal





Scheme showing the metabolism of essential fatty acids; their role in inflammation; and the effect of glucose, sucrose, and fructose on the activities of desaturases and formation of various eicosanoids, cytokines, and lipoxins, resolvins, and protectins. (p) Indicates increase in the activity or enhanced formation. (d) Indicates decrease in the activity or decreased formation. Glucose, sucrose, and fructose may decrease the activities of D6 and D5 desaturases and thus, decrease the formation of AA, EPA, and DHA that are precursors of various eicosanoids and lipoxins, resolvins, and protectins. Glucose, sucrose, and fructose seem to enhance the formation of proinflammatory prostaglandins, leukotrienes, and thromboxanes and decrease the formation of lipoxins, resolvins, and protectins that have anti-inflammatory activities and prevent development of type 2 diabetes mellitus, metabolic syndrome, and insulin resistance; they also may enhance the formation of proinflammatory cytokines and decrease those of antiinflammatory cytokines. The proinflammatory activities of glucose, fructose, and sucrose may be in the order of fructose.

# Genetic Modified (Engineered) Organisms



GMOs are created by removing the genetic material from one organism and inserting it into the permanent genetic code of another. Biotech industry has created an astounding number of organisms that are not produced by nature and have never been seen on the plate. At an alarming rate, these creations are now being patented and released into our environment and our food supply.

These include potatoes with bacteria genes, “super” pigs with human growth genes, fish with cattle growth genes, tomatoes with flounder genes, corn with bacteria genes, and thousands of other altered and engineered plants, animals and insects.

# An Issue of Risk Assessment

- A number of studies over the past decade have revealed that genetically engineered foods can pose serious risks to farmers, human health, domesticated animals, wildlife and the environment.
- African agriculture and food security problem lies more with maximizing resources and efficient application of agric-biosciences

# Key Health Issues - 1

- Toxicity: Inserted genetic material are inherently unstable. Each insertion of a novel gene, and the accompanying "cassette" of promoters, antibiotic marker systems and vectors, is random. Contrary to the claims, not much is known about where the genetic "cassette" is being inserted in the food, nor is enough known about the genetic/chemical makeup of foods to establish a "safe" place for such insertions.

As a result, each gene insertion into a food amounts to playing food safety “roulette,” with the companies hoping that the new genetic material does not destabilize a safe food and make it hazardous. Each genetic insertion creates the added possibility that formerly nontoxic elements in the food could become toxic.

- Allergic Reactions – GMOs can transfer allergens from foods to which people know they are allergic, to foods that they think are safe; and create new allergens from novel proteins (in the form of altered genes, bacteria, viruses, promoters, marker systems, and vectors) which have never been part of the human diet.

# Key Health Issues - 2

- Immuno-suppression
- Antibiotic Resistance Microbes through the food chain.
- Cancers: Levels of a hormone, insulin-like growth factor-1 (IGF-1) are increased in dairy products produced from cows treated with rBGH. IGF-1 is an important factor in the growth of breast cancer, prostate cancer, and colon cancer. The compound can survive digestion and make its way into the intestines and blood streams of consumers.

# With Lack of Facility to Adequately Monitor GMOs, Nigeria should

- Halt the approval, commercialization and/or release of any new genetically engineered crops until they have been thoroughly tested in Nigeria and found safe for human health and the environment.
- Any foods that already contain GM ingredients must be clearly labeled, and institute a programme for the containment and reduction of existing genetically engineered crops.

# Bioresources Development Group

[www.bioresources.org](http://www.bioresources.org)

[www.intercedd.com](http://www.intercedd.com)

Email: [bdcp@bioresources.org](mailto:bdcp@bioresources.org)

[iwum@bioresources.org](mailto:iwum@bioresources.org)



Thank You !!!