14th World Congress of Food Science & Technology
第十四届世界食品科技大会

CERTIFICATE FOR ORAL PRESENTATION

发 言 证 书

Recognition for participating and contributing the oral presentation in the 14th World Congress of Food Science and Technology from Oct.19th to 23rd, 2008 in Shanghai China.

兹证明下列人士参加了第十四届世界食品科技大会并进行口头报告。

Title(题目): Global warming in food origin and health concern

Speaker(演讲人): Ugur Gogus

IUFoST

14th WORLD CONGRESS OF FOOD SCIENCE & TECHNOLOGY ORGANIZING COMMITTEE

Session Chair
专题主持人 Shaotwei

T18: Food Market and Sustainable Development in 21st Century

Venue Guang Da No.9 (2nd floor)
Chaired by Sharon Shoemaker
Rao Pingfan

Time	Contents
8:30-8:50	TBD Sharon Shoemaker, University of California in Davis, USA
8:50-9:10	Food service quality survey at the university of Zimbabwe supermarket canteen Chakare Benhura, University of Zimbabwe ,Zimbabwe
9:10-9:25	Food security in the Asia Pacific Region in the 21st Century Alastair Hicks, Food and Agriculture Organization of the United Nations, Mae Fah Luang University, Thailand
9:25-9:40	Challenges to the food industry from urban agriculture Albert E J McGill, Future For Food, Australia
9:40-9:55	Aquatic products processing industry in China: Challenges and outlook Jianrong Li, Food Science and Biotechnolog College of Zhejiang Gongshang University, China
9:55-10:10	Study on gelatin processing from TRA (Pangasius hypophthalmus) catfish skin Ha Thanh Toan, Biotechnology Research and Development Institute (BiRDI), Can Tho University (CTU), Vietnam
10:10-10:25	Young Vietnamese consumers' expectations towards dairy products: Conventional survey vs. hard laddering techniques Thanh Ba Nguyen, Ho Chi Minh city University of Industry, Vietnam
10:25-10:40	Cassava starch fermentation wastewater as a new raw material Edna Regina Amante, Universidade Federal de Santa Catarina, Brazil
10:40-10:55	Global warming in food origin and health concern Ugur Gogus, Middle East Technical University, Turkey

T19: Separation and Purification Technology & Physico-chemical Property Modification of Food Macromolecules

Venue Guang Da No.8 (2nd floor)
Chaired by Lim Chee Kian
Li Lin
Wang Zhengwu

Time	Contents
8:30-8:45	Liquid and Supercritical Carbon Dioxide for the separation and fractionation of valuable plant constituents Petras R. Venskutonis, Kaunas University of Technology, Lithuania
8:45-9:00	Removal of linoleic acid from ethanolic solutions with ion exchange resins Erika Cren, UNICAMP, Brazil

14th World Congress of Food Science & Technology

第十四届 世界食品科技大会

Oct. 19~23, 2008 Shanghai, China

2008年10月19~23日 中国·上海

PROGRAM

大会指南

FOOD FOR HEALTH AND WELLBEING

WHERE TRADITION MEETS THE FUTURE

中国食品科学技术学会
Chinese Institute of Food Science and Technology (CIFST)

国际食品科技联盟
International Union of Food Science and Technology (IUFoST)

GLOBAL WARMING in FOOD ORIGIN and HEALTH CONCERN

ABSTRACT

Food is not only a matter because of it's vitality for energy production and productivity of metabolism but today it introduces it's new face by contributing to global warming in the case of it's wrong use. It reveals it's different positions as a poison or a medicine with it's harmful effects on human metabolism when unconsciously selected and consumed, like increasing cholesterol and leading hypertension or beneficial effects when consciously selected and consumed, like lowering sugar and helping to control Diabet. Presently and fortunately, but lately, we could understand that it is not only effecting human metabolism harmfully in the case of it's wrong use, but it's wrong use is also contributing to the global warming at a great scale. Contribution of food to global warming works within two ways as it's direct adverse effect on global warming and it's adverse effect on human health and total quality of food while contributing to global warming. On the other hand, Global Warming increasing effect of food may be classified as in four groups as; Process, Livestock with it's manure, Food Miles and Fertilizer use. Especially, livestock in meat industry appears as responsible from significant amounts of greenhouse gasses. Packaging as in accordance with the increase in processed food consumption is the one that emits CO_2 most. Each process step including cooling, heating, fuming and freezing all emit of greenhouse gasses most of whom are CO_2 and nitrose oxide. The distance between production unit of food and market, food mile, is another contributor to global warming but needs correct definition since shorter food miles may not necessarily mean low amount of greenhouse gasses because of big capacity tracks. Therefore, food mile per tone should be concerned in the evaluation of a food production's contributing effect to global warming rather than food mile. Minimizing food mile which can only be maintained by encouraging and supporting local farming may result in decrease of waste and pollute amount of papers and plastics, less fossil fuel use contributing to lessen Global Warming. Another contributer as food related is the organic and inorganic fertilizer use that latter one, especially nitrogen fertilizer, yields two important greenhouse gasses; nitrous oxide and ammonia. Milk, dairy and meat productions always require high or low amount of fertilizer use which results in methane, nitrous oxide, ammonia and carbon dioxide. Also most of these productions are consumed as processed and therefore needs various food processing techniques which increase the emission rate of greenhouse gasses by using gas, electricity, packaging material and food additives. CO_2, one of the most important greenhouse gasses, in livestock or industry origin, followed by its accumulation in plant tissue which is taken to human metabolism by the consumption, causes oxygen depletion and carbon monoxide formation which is very toxic for metabolism. At this point, we face with the threat of livetock due to its manure and gas release. Child and young group may prefer and should prefer animal origin since it will enhance their growth and reproductivity with its high protein quality and essential amino acids, but it should not be neglected that avoidance from their excess amounts in adult nutrition can protect against important metabolic diseases and disorders. We strongly need education of adult who has to tend to protein consumption in plant origin which may significantly lessen greenhouse production due to livestock production while beneficially effect adult human metabolism. Another important adverse effect of global warming in food origin is its triggering effect on harmful plankton increase which require warmer water surfaces supplied by Global Warming. Not only the increasing risk of shellfish poisoning due to these harmful planktons, but also putrefaction of planktons which result in carbon and carbonic acid will make shell production impossible. We already began to loose shellfish as the most important filters of our oceans and other water supplies. Perhaps lately but fortunately, we have still got some solutions which should be done immediately as related

to 'Global Warming in food origin'. In the concerned article, these solutions were also mantioned.

INTRODUCTION

Food has always been concerned as a must for living and for metabolism with it's nutrients. But it has gained a new concept and become a parameter, an important factor for the future of human and world. This new concept or its definition in its new concept is Global warming. Global warming was always analysed with environmental, biological, physical, biochemical and aerospace dynamics. On the other hand, food and agriculture has been appeared even more effective on global warming. With the data and discussion which will be indicated below, food is even much stronger contributer to global warming as at a rate of over 30 % when compared with other factors. Therefore, food and agriculture with their details, should be criticised and more importantly, should be remodified by reducing their adverse effects on global warming.

Food has got two adverse and triggering effects on global warming. First effect is its direct effect on global warming since it produces and releases various important gases to atmosphere. Second effect is the adverse effect of a food which is produced in a globally warming on human and animal metabolism as it will be a potential risk of food poisoning and infections. Not only these effects, but also total food quality with its sensorial, chemical and microbial quality criteria will also be adversily effected by global warming. For this reason, a close interaction between food and global warming shows itself clearly while they adversily effect each other.

DISCUSSION

Global warming increasing effect of food may be criticised in four parts as; process, fertiliser use, food mile and livestock with its manure. Sera gases namely CO_2, methane, nitrous oxide and ammonia are known as the initial gases and main causative factors which cause global warming. Because these gases, in the case of their release in greater amounts from earth surface, accumulate just beyond atmosphere and form a thick layer. This layer interrupts emitted UV entrance into the atmosphere and therefore emitted UV lights are kept by the earth which seems as the main causative factor of global warming. Because of this great effect of the mentioned greenhouse gases, one of the only solutions to delay global warming is the limitation of greenhouse gas production all over the world. Automation industry, electricity and all others emit these gases in different ratios but only livestock accounts for 9 % of CO_2 deriving from human-related activities, 65% of human-related nitrous oxide, 296 times the Global Warming Potential (GWP) of CO_2 in manure origin, 37 % of all human-induced methane (23 times as warming as CO_2), produced by the digestive system of ruminants, and 64 % of ammonia, contributes significantly to acid rain. Agriculture and food accounts for 30 % of goods which are transported on Europe's roads. The hude ratio belongs to food and agriculture seems due to the nature of food industry rather than food itself. For example, there are 52 process steps for only ketchup production, each of which need transfer, electricity or agriculture commodity such as fertilizers which all contribute to global warming with their sera gases in great ratios. Here is an important criteria arises; the importance of raw food, its preference and importance on human health and metabolism, because of processed food

which needs industry and industrial production steps results in sera gas relases to the atmosphere and therefore the risk in triggering global warming.

Not only in the ketchup example mentioned above, but for all processed food products, many process steps, even more than 52, can be mentioned. This indicates to the great contribution and potential about greenhouse gas production of food industry. Humanbeing has got this industry for over hundred years which differs only in production steps and technology. But all through the years, foods were treated with salt, phosphate, sweetener, organic acids, bacteriosins, probiotics, protein additives, enzymes. Different technologies have been applied to them such as fuming, curing, fermentation, radiation, heating, canning, cooling and freezing. Either these tehnologies or the food additives are applied to increase the shelf life of the product by increasing sensorial, microbial and chemical quality. Not only the shelf life by the means of microbial quality, but also nutritional food compounds such as essential amino acids, fatty acids, proteins, isoflavones, whey proteins, pre and probiotic combinations are also added to food products to increase their nutritional and functional attributes. Briefly, the application of food technologies, the addtitives added to them and production steps to produce, are all in good aim and purpose; increasing shelf life, chemical, physical and nutritional quality criteria of food. While doing this, fortunately and unfortunately, it has formed its industry. Fortunately, because it has supplied great level of employment to people to work and gain money. But what about unfortunate results?. It can be answered in two parts. 1. too many technological and additive contributers have been applied which most of them unnecessarily and adversily effected human and animal metabolism like increasing cholesterol, sugar and salt concentrations of blood profile. Cips, kraker, biscuit, ready eat soups and similar products with their technologies served for longer consumption periods with their longer shelf lifes but caused cancer, atherosclerosis(calcification of blood vessel), hypertension, stroke and Diabet with their rich trans fatty acid consumtion. Food industry produced its margarin and oils which could be used in solid forms but hydrogenisation in margarin production caused trans fatty acid formations and high amount of trans fatty acid consumption has accomplished with important metabolic diseases such as hypertension, stroke, cancer and diabet. Sweeteners in controlling blood sugar concentration which are not absorbed from gastrointestinal mucosa because they are nonsoluble fiber structures, unfortunately, acted as cancerogens and like aspartam and Asesulfam K, many of them were proven to increase stomach, intestine, jejunum, colon and rectum cancer risks. Nitrat and nitrit additives to prolong shelf life formed nitrosamines which are strong cancerogens, incerased cancer risk. Fast food based on frying process, appeared as one one the main predisposed factor leading obesity and cancer with its high fat and low fiber content. But more than that, frying of oils more than one time formed polycyclic aromatic hydrocarbones which are strongly cancerogens. Curing technology that uses salt, phosphate, nitrat and nitrit increased Diabet, cancer and atherosklerosis risk while fume in fuming technology increased cancer risk with its polycylic aromatic hydrocarbones and formaldehyde. Significantly, high amounts of food addtive, coloring, antibacterial, emulsifier ect.. have increased the metabolic disease risk. Finally, we have come to an important stage. Raw, non processed food and their preference and consumption for better health and on the other hand processed and fast food for being liable to the disases and disorders. We have got important and sufficiently enough data as related to the importance of life style which is based on raw food nutrition which are not artificial and technologically processed in being resist against metabolic disease and disorders. Even in the consideration of heating technology, the biogen amin production capasity of heating can not be neglected. Cooling and freezing can cause significantly important losses of vitamin C which as a very important antioxidant to control blood sugar, cholesterol and to reduce free toxic peroxy radical compounds(the inflammatory agents and

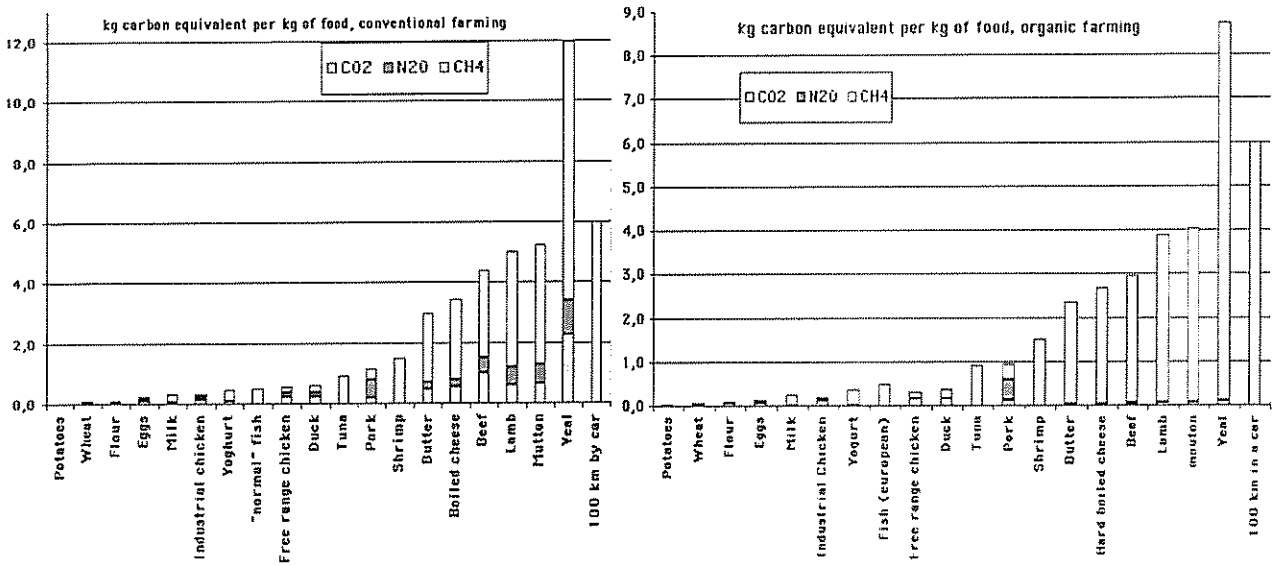
end products of oxidation). Besides scientific platforms, also media and education have taken a start to educate different age target groups about the importance and beneficial protective effects of raw and natural food consumption rather than processed, of course in limited conditions. Raw salad preperations rather than cooked vegetables (which results in great losses in water soluble antioxidants), low but enough amount of heat level in heating process for vegetable and meat to minimise essential fatty acid, mineral and vitamin loss should be taken into the consideration importantly. Sulphur which can escape from vegetables because of excess heating is deathly important in detoxification of liver. Therefore, sulphur rich foods which help to the detoxification process of liver enzymes (cytochrom P-450) by supporting sulphorilisation should not be treated with excess heating during heating process. Briefly, under hygienic cleaning and washing procedures, but by limiting technology and food addtive use, life quality and resistance to metabolic diseases can be possible. Perhaps, we are turning back to the beginning, perhaps, we should do this while we also continue to take support from food industry and technology. This relation between raw and natural production and consumption of food with health, metabolic diseases and disorders that were mentioned here in detail is not a new concept. It is still widely supported with more and more research findings. Importantly, a new concept has arised. The processed food with its process steps and technology, not only hazardous for metabolism and health, but also with its great greenhouse gas production capacity, is also a great contributor to global warming. High carbon containing foods such as meat and dairy, meat and meat products cause high carbon accumulation in blood. Carbon in excess amount is converted to carbonic acid which also increases cardiac muscle contraction and therefore hypertension risk. Excess amount of carbonic acid comes to lungs from cardia by using blood circulation which results in blockage of oxygen intake into the lungs. Missing oxygen is replaced by taking it from carbonic acid which forms carbon monoxide, a deathly poison, can cause stroke and toxemia which results in death. Heating meat as previously indicated, forms biogen amines that are cancerogen. Many of the milk and dairy products are high in sugar(lactose) and cholesterol. Egg and egg products are one of the richest source of cholesterol. All scientific research findings revealed the close relation between high amount of milk, dairy, meat and their products (animal origin) and metabolic disease and disorder risks. Therefore, nutrition style should be clearly in vegetable and fruit origin, supplied with high quality animal origin which should be nonfatty and light processed. The advise at this point can not be completely fruit and vegetable since animal origin proteins are greatest in protein quality with their uncomparable biologic value, net protein utilisation level and essential amino acid contents. Without the supplementation of these proteins, a healthy diet can not be designed. But, what I try to mention here, is the necessity of the fruit and vegetable domination as raw and non processed rather than processed animal origin. At the background, important essential animal origin proteins should be accomplished. This may seem conflicting because the adverse effects of animal origin foods which are high in cholesterol and process, has just been mentioned. But, two important protein sources; 1. fish meat and shellfish and 2. whey proteins (milk sera proteins) can be the main high quality animal origin protein supplies of today's healthy diet while dominating fresh fruit and vegetable. Fish meat and shell fish are free of cholesterol but they have got cholesterol decreasing essential fatty acids, omega 3. They are very rich sources of selenium, zinc, A,D,E,K, Mg, folat and folic acid antioxidants near high quality proteins. The main advantage of whey proteins is their natural production. Whey production only requires filtering but no heating, concentration, cooling, freezing ect..They are not only high quality animal origin proteins but also increase glutathion protective layer around cells and act as antiaging, lower cholesterol and sugar, improve muscle and bone progress and protect against inflammation by increasing glutathion antioxidant. Acception of fish meat and whey to the diet, restriction of red meat and dairy product consumption in daily life will first limit the fertilizer use in food

industry which is one of the great contributers to global warming with its greenhouse gas production. Fertilizers are the substances in organic or inorganic character which improve plant production. Organic fertilizers such as manure, slurry,warm castings, peat, seaweed, sewage,guano/manufactured ones;compost, bloodmeal, bone meal, seaweed, fish meal, feather meal, digested protein contain insoluble nitrogen. Therefore, they act as a slow release fertilizer to mobilize soil nutrients. So, good and better growth with lower nutrient densities are required while causing low amount of waste production. The relase of nutrients at a slower and more consistent rate helps to avoid a boom and bust pattern. These types of fertilizers also help to retain soil mositure which reduces the stress in soil due to temporary moisture stres. But one of the greatest disadvantage of them is the pathogens they may contain which are harmful to human and animal and which may result in carbon dioxide and nitrose oxide formations. For this reason, they require proper composting prior to their application and use in soil. Inorganic fertilizers such as sodium nitrate, rock phosphate, limestone (a calcium source) have got a possible "burning"risk of plants with their concentrated chemicals nitrogen (N), phosphorus (P), and potassium (K), which are known as N-P-K. They have also got the risk of decrease of real or perceived soil health, may cause loss of structure, reduced ability to absorb precipitation, lightening of soil color. Many times, they require the neccessity of reapplying artificial fertilizers regularly and perhaps in increasing quantities to maintain fertility. Finally, they may cause extensive runoff of soluble nitrogen and phosphorus, leading to eutrophication while rising cost is another problem of them in recent years. Both types of fertiizers have got a capability in greenhouse gas production, but this capacity is higher for inorganic ones such as nitrogen fertilizer. This fertilizer is produced by using a process called Haber-Bosch which is the reaction of nitrogen and hydrogen, over an iron substrate, to produce ammonia (NH_3) which can then be oxidized to make the nitrates and nitrites. Ammonia (NH_3) may be emitted by followed application of the concerned inorganic fertilizers, manure or slurry which can contribute global warming. On the other hand, storage and application of some nitrogen fertilizers in some weather or soil conditions can cause emissions of the greenhouse gas nitrous oxide (N_2O) which is another contributer as another greenhouse gas to global warming. The production of ammonia currently consumes about 5% of global natural gas consumption, which is 2% of world energy production. The cost of natural gas makes up about 90% of the cost of producing ammonia.

Near inorganic fertilizer use, another problem arises is the red meat production since manures and urea of these animals which are used in meat production release methane, nitrous oxide, ammonia and carbon dioxide. But these manures, urea and slurry are also used in the production of mentioned fertilizers which requires collection, storage and spreading on the farm which all emit these greenhouse gasses in large quantities. Especially, fertilizers which contain nitric acid or ammonium bicarbonate results in the emissions of nitrogen oxides, nitrous oxide and carbon dioxide into the atmosphere. The productions of meat, milk and poultry, with their process steps and also manure and slurry of these animals and the production of fertilizers from the manures of these animals increase the emission rate of greenhouse gasses by using gas, electricity, packaging material and food additives.

As indicated and discussed with its initial details and also can be seen in Figures below, although they are the uncomparable, the most quality proteins, animal origin proteins, the owners of them, husbandry animals, their growth and feeding, fertilizer production to grow these animals which are produced from their manure and slurry, are all great contributors to greenhouse gas productions in great quantities. Stil, in United States of America, fast food and animal origin consumption is the main nutrition style (Eshel and Martin, 2006). Over the last 40 years, meat consumption has increased 40 % while the world population doubled.

Meat production has been multiplied by 3.2. Note that, every cow in ECC is subsidised by $2.5 a day. On the other hand one in five people in the world lives on less than $1 a day!!!.



We have got two conflicting realities at this stage. 1. Animal origin proteins are the uncomparable and the most qualty proteins with their higher biologic values and net protein utilisation degrees but 2. The same proteins and the productions of them have become one of the most powerful contributer to global warming. So, what may be the solution? It seems currently that, either the elimination of the production of these proteins or the growth, feeding and fertilizer use and production are all impossible since they are the most quality proteins and required by metabolism and body functions strongly as structural body components. The solution may only be the limitation of the production of the proteins in meat and poultry origin. Of course, while mentioning this, vegeterianism should not be understood, since it is not a healthy nutrition style. But limitation and replacement of especially red meat and poultry products with sea origin foods (shellfish and fish meat) and whey proteins can reduce the amount of the slurry, manure production on earth and naturally the greenhouse gas emissions from them. This aspect is the only one side of the problem, but the other side which is more important is the risk of high amount animal origin protein consumption on health from the point of metabolic diseases and disorders as indicated above. The limitation to fast food, red meat production and poultry meat production and their replacements with sea origin foods and whey proteins can decrease the total greenhouse gas emittion from earth significantly important while effecting beneficially health and metabolism.

One of the most adverse effect of red meat production and nutrition may not only be triggering on global warming and problem on health and metabolism, but higher carbon dioxide level increase in manure and slurry origin may cause decrease in protein amounts of crops especially potatoes (14%), barley (>15%), wheat and rice (10%) and soy bean (1.4%). A study published in Science suggests that, due to climate change, "Southern Africa could lose more than 30% of its main crop, maize, by 2030 (Lobell et al, 2008). For rice, the amylose content of the grain-a major determinant of cooking quality-is increased under elevated CO_2 and decreased nitrogen. Cooked rice grain from plants grown in high-CO_2 environments would be firmer than that from today's plants. However, concentrations of iron

and zinc, which are important for human nutrition, would be lower (Seneweera and Conroy, 1997). Moreover, the protein content of the grain decreases under combined increases of temperature and CO_2 (Ziska et al. 1997). Also elevated CO_2 has begun to decrease crop yield (Rosenzweig and Parry, 1994).

Studies have shown that higher CO_2 levels lead to reduced plant uptake of nitrogen (and a smaller number showing the same for trace elements such as zinc) resulting in crops with lower nutritional value (Ziska et al. 1997). This would primarily impact on populations in poorer countries less able to compensate by eating more food, more varied diets, or possibly taking supplements.Reduced nitrogen content in grazing plants has also been shown to reduce animal productivity in sheep, which depend on microbes in their gut to digest plants, which in turn depend on nitrogen intake.

The decrease in protein amount may be due to the carbon accumulation in the plant tissue that reduce the concentration of nitrogen, the most important structural component for protein synthesis (J. Glb. Change. Biol, Southwestern University/Texas). Briefly, more red meat and poultry productions may result in protein decrease of plant origin while triggering global warming.

The solutions such as the limitation to the production and consumption of red meat and poultry may seem not so easy since the proteins of these proteins are vital for metabolism and health. Therefore, people may anticipate and reject this type of approach at first. Therefore, an important education by the means of media and school should immediately be organised and planned to make people conscious for a new life and nutrition style. For example, body lenght may increase especially by milk and dairy product consumption as combined sport. But this effect on body lenght is no more possible after 30 years old since young bone cells will have become matured and lost their calcium binding capacity. But if the same nutrition style continues after this age, excess amount of cholesterol that comes from these milk and dairy products can accumulate beyond cell walls and may cause hypertension and other cardio disorders. Briefly, older target groups should prefer plant origin proteins instead of animal origin since they will have completed their progress and maturation with animal origin proteins in their youth. Also the ratio of adult and elderly who consume and prefer animal origin products in United States, Turkey, Middle East countries and Europe is very high and has been increasing at great levels.

Another important effect of food and food industry on global warming is the food miles. Food mile may be defined as the distance between marketing and production points of food. These distances are very important since the trucks which transport the raw material to process unit or processed food to marketing point waste petroil and electricity to cool or freze the product during their transfer and therefore emit great amounts of greenhouse gasses into the atmosphere. For this reason, food miles should be designed at small scales. In other words, local marketing and production should be encouraged rather than big scale and international productions that require long distances. A producer who produces for only nearby environment and a market owner who buys from a nearby producer can decrease the waste of oil and electricity amounts and greenhouse gas productions at significantly important levels since shorter food miles will burn less energy and emit less greenhouse gasses. These solutions have got advantage and disadvantage. Shorter food mile approach may take protests, may be anticipated because of the limitations and restrictions in international import and exports but also among cities in each country. On the other hand, it has got an uppermost importance which is related with the near future of the world that it can decrease the amounts

of the grenhouse gas production while supporting local marketing. Local marketing can also create new employments for its close environment and people. More importantly is the advantage and solution of unemployment and global inflation by supporting food industry in local areas. But food mile approach should be made by the correction of the food mile definition. In the case of 10 tons of product transfer to the market 100 miles away, a truck in 1 ton capacity should have to make 10 trips which makes totally 1000 miles. But the same amount of product transfer to a market which is 1000 miles away by a truck in 10 ton capacity should have to make 1 trip which also makes 1000 miles. The food miles of these examples appear the same but it is obvious that the second example will give much more greenhouse gas since 10 ton capacity will use more fuel than 1 ton capacity truck in spite of only one trip. Therefore, the criteria in the definition of food mile should not be the mile alone, rather than that, should be 'food mile/ton'. It should never be neglected that food mile limitations will not only support local producer and market owners and be helpful to solve unemployment but it will have got many other advantages. Less fossil fuel will be used to transport foods. Less carbon dioxide, sulfur dioxide, particulate matter and other pollutants into the atmosphere emission will be possible which may slow the progress of global warming. An important energy saving to keep fruits, vegetables, dairy products and meats with less energy will be possible. There will be decrease in waste and pollute amount of papers and plastics (many times difficult to reuse and recycle) in packaging to keep food fresh for longer periods in the case of long food miles. Industrial farms are the major sources of air and water pollution whereas local ones not. Local farmers work with small scales whereas industrial farms use bigger, therefore they use pesticide, herbicide, antibiotic, hormone, GM, fertilizer and contribute more to the global warming. The preservatives, hormones, some packaging materials, additives can be harmful for human and animal metabolism. Finally, the longer the food miles the higher the risk for the contamination of an infection or poisoning agent by the means of transported food to a wider area. But the responsible product can be detected if the market and producer is local. Every company will want to sell to the long distances to increase their profit and may not be enthusiastic to this approach that can turn to the local marketing every time. Therefore, legal sanctions for the minimum food mile/ton for each food company should be determined and marked. Government inspectors should control and government should not give permission to the other markets in far distances to sell the products of the local food producer. It should be noted that, in United States of America, 80% of meat production is belong to only four companies (USDA,1998). This situation is even worse in Turkey. Food products in a typical supermarket in United States are produced by not more than 10 multinational companies (Halweil, B. 2006). It is also very similar for Turkey. Food miles although a fraction of the United States energy consumption a s a whole, remains a considerable source of carbon emissions, especially when considering that United States is the largest emitter of greenhouse gasses in the world accounting for 23% of the global at nearly 1600 million metric tons annually. The United States food system alone uses as much energy as a France's total annual energy consumption (Murray, D. 2005).

Another important harmful progress of global warming is also in food origin. The increase of carbon dioxide has shown its main adverse effects on oceans, the strongest protector against global warming with ther planktons. High carbon dioxide accumulation in oceans and in the body of plankton will damage the plankton and they will sink to the bottom. Their composition will consume oxygen and oxygen will be depleted while dissolved carbon dioxide will be transported to the seabeds and will kill shellfish since these creatures can not produce cell in high carbon and low oxygen concentrations. Shellfish, not only a very nutritious food, but also the filters of oceans has already begun to decrease with the mentioned mechanism. But also high carbon content of plant body will make it less nutritious

and this will also affect the predators of plankton adversily. Briefly, humanbeing may face with the decrease in fish and marine food in a very near future.

While depleting and threating fish and marin life, an increase in shellfish poisoning in a very high possibility in the very near future should also be taken into the consideration. Melting of huge amounts of ice in the Arctic region increases the fresh water amount on the surface which creates a warm, less dense stream. It circulates through the south Atlantic, Western Europe, North Africa, the coasts of India and China, north Australia and New Zealand and returns to the Arctic region. Through this circulation, by the effect of UV rays, gases, radiation and also heat, significant amounts of water are evaporated and become more salty and dense. The second stream is created because its high density and salt content circulates deep below, not on the surface. This deep stream, cold and in high density, makes its circulation through north Australia, the coasts of China and India, north Africa, western Europe and returns back to the Arctic region to gain more fresh water because of the ice melting in the Arctic. This cycle will continue endlessly as long as the ice in the Arctic region continues to melt. The threat at this point is the global warming which triggers temperature increases in Arctic regions, resulting in a higher volume of fresh water which is less salty and less dense and therefore less cold. In other words, the Gulf Stream increases water surface temperature. This increase of water surface temperature through the action of the Gulf Stream may stimulate poisonous dinoflagellate growth which tends to grow on surface in higher temperatures such as; orders of *Gonyaulacales*, *Gymnodiniales*, *Peridinales* with *Pyrodinium bahamense* var. *compressum* and *Polysphaeridium zoharyii* of southeast Asian waters (Furio and others 2006) and the orders of *Littorinimorpha* (e.g. *Bembicum nanum* and *Polinices* sp.) and *Basammatophora* (e.g. *Siphonaria zelandica*) (Przeslawski and Benokendorff 2005). Cyanobacteria is another risk which should be strongly concerned in a media globally warming.The risk which appears clearly is the stimulated growth of Cyanobacteria by the effect of global warming whose maximum toxin production is between 18-25 °C (Runnegar and others 1983; Watanabe and Oishi 1985; Ohtake and others 1989). The second threat may be the deep cold stream's stimulating effect on some algal blooms which require cold temperatures found in deep waters such as tropical *Halimeda tuna* on the Conch Reef of Florida (Smith and others 2004).

CONCLUSION

The contribution of food and food industry with its process, agriculture, fertilizer, raw material and transfer is much more than ever expected. In the light of the details mentioned above, we may carry out the protective actions as related to global warming in food origin and slow the speed of the disaster. These protective actions and possible solutions may be ordered as follows;

- Each company's minimum food mile and market should be marked. Government inspectors should control and government should not give permission to the other markets to sell the products of the concerned food company.

- Legal sanctions to each meat and poultry meat entegrated company to create a local forest nearby (or on a nearest area to the plant) and they can prefer or must prefer GM crops which is weed killer, so they will not need to plough and organic matter in the soil is not exposed to the atmosphere.

- Supporting and encouraging Local Farming

- Limitation to fertilizer use
- Motivating people over 30s to plant origin consumption rather than animal origin by education and using media.
- Population and family control directed by sociologists, doctors, academic staff and food engineers and scientists as in close cooperation.
- Limitation to food miles with the consideration of correct defination of 'food mile'
- The monitoring units construction by seaside countries that work with weekly mouse bioassay testing, LC with fluorometric detection, LC-MS, phosphatase inhibition and a web based information system to be able to control and screen shellfish poison which is triggered by global warming. All these countries should close their harvest areas when the number of plankton cells exceeds certain concentrations.

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WELCOME

14TH WORLD CONGRESS OF FOOD SCIENCE AND TECHNOLOGY



Prof. Pan Beilei

Chair, 14th World Congress of Food Science and Technology
President, CIFST

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第十四届世界食品科技大会主席
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It should come as no surprise that in the year 2008 the same year the Olympic Games were held in Beijing the 14th World Congress of Food Science and Technology will come to Shanghai, one of the most vibrant and the exciting cities in China. On behalf of the Organizing Committee, it is our pleasure to welcome you to join us in Shanghai.

The Chinese food market has rapidly grown at a rate of 20% per year for the past 10 years. It is no longer unusual to find Chinese food technologists and businessmen collaborating closely with their international colleagues. Simultaneously, Asian foods and diet have attracted more and more attention around the world.

China is the perfect setting for this Congress with a food industry that leads the world at an incredible 27%, as a country with the longest tradition of pairing food with health, and with the largest number of food professionals in the world. As a traditional, modern, and international city, Shanghai is also the natural choice as China's premier example of tradition meeting the "cutting edge," and therefore the best place to discuss Food for Well-Being, showcase for food from past to present to future.

Chinese food industry and academics are endeavoring to seek solutions for issues of food safety, the shoraget of primary products, environment protection and energy saving, protection of traditional culture and industrialization of traditional foods, balanced diets and weight loss. These are issues facing the international community as well as China. At the same time, the food industry in the other countries and regions are also exploring new concepts, innovations, reformations and practices.

And so this Congress will stand for a meeting of minds. The global authorities in food science and technology will meet together to uncover answers to these questions and to meet the challenges of the future.

We, the Chinese Institute of Food Science and Technology have made adequate preparation for the Congress. Now we are ready to meet all of you in the golden autumn in Shanghai. To achieve the mission of the Congress under the banner of science, progress and friendship.

Welcome and we wish the Congress success!

在举世瞩目的北京奥运会刚刚闭幕之际，被誉为"食品界的奥林匹克"的第十四届世界食品科技大会于10月19-23日在中国最具活力的城市—上海召开。在此，我谨代表大会组委会，同时以我个人名义向来自全世界66个国家和地区的参会代表们表示真诚的欢迎。

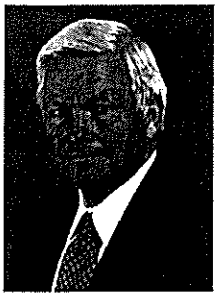
近10年来，中国食品工业以每年20%以上的速度快速增长，并日益发展成熟。中国食品科技界、企业界与世界各国、各地区同行们的交流日趋活跃。东方食品及东方的饮食结构越来越受到世界的关注。高速增长的食品工业、药食同源的悠久传统以及拥有全球最大数量的食品科技专业队伍，使得中国成为举办这次盛会的理想国度。作为具中国传统、时尚、科技特征的世界级大都市—上海，更是研讨食品与健康的历史与未来、促进食品科技发展的理想地点。

尤为重要的是，中国食品产业在发展过程中的成功、困惑与问题，既呈现区域性特征，又属全球性的思考和探索内容。当食品安全、农产品资源紧缺、环保与节能、工业食品与传统文化的保存，减肥与膳食平衡成为困扰中国食品工业持续发展中必须破解的难题时，全球其它国家和地区的食品工业也面临着相同的新一轮从理念乃至工艺与设备的深刻变革与创新。因此，集中全球科学家的智慧成果，寻找食品工业持续发展的创新之源，寻求新的突破，是此次会议的目标，也是共同的需求。

我们共同肩负着重要使命，本次会议将云集全球食品界的精英，汇聚食品科技界的骨干，以科学的观点，对食品工业做前瞻性的研究和讨论，以共同应对充满挑战的未来。

中国食品科学技术学会已经为本次会议的召开进行了充分准备，我们期待着全球食品科学家、企业家代表在金秋的上海相聚，在科学、进步、友谊的旗帜下，完成第十四届世界食品科技大会所承担的历史使命。

欢迎你们，期待大会成功！



Prof. David Lineback

President (2006-2008 , IUFoST

David Lineback教授

国际食品科技联盟主席（2006-2008）

Forty six years after the first World Congress of Food Science and Technology in London in 1962, it is our pleasure on behalf of the International Union of Food Science and Technology (IUFoST) to participate in the 14th World Congress being held in Shanghai, China. The Congress has been organized and hosted by the Chinese Institute of Food Science and Technology (CIFST).

Three Asian cities have hosted World Congresses: Kyoto (1978), Singapore (1987), and Seoul (2001). Congress XIV in 2008 will have the theme "Food for health and wellbeing-where tradition meets the future." Our Chinese hosts will create an opportunity for us to compare and contrast the Chinese tradition of health from beneficial foods and herbs with modern concepts and technologies.

Seven plenary lectures and the young scientists' presentations will be feature events in the Congress. Also included will be 14 symposia emphasizing current issues in food science and technology, four sessions concerning developments in the food industry, and 28 technical sessions on various aspects of food technology and technology (food safety, functional foods, food nutrition and health, oriental foods culture and food as medicine, new product development, sustainable development of the food industry, food chemistry, food storage and logistics, food biotechnology, food processing equipment). The sessions clearly feature the development and future directions of global food science, technology and the food industry.

Congress XIV received an unprecedented number of abstracts, of which over 2000 were accepted, including 1069 posters to be showcased during the Poster Sessions. A new feature will be an "IUFoST Global Food Industry Award", being introduced to mark innovation and excellence in products, packaging and marketing.

The International Food Science and Technology and Industrial Innovation Exhibition will be held at the same time of the Congress. Food industry from around the world will be able to use this event to explore opportunities, to enhance corporate images, seek international partners for cooperative efforts, and promote international trade exchanges and collaboration.

We believe that this Congress will offer you opportunities for expanding your professional horizons, meeting and discussing issues with international colleagues, and becoming more aware of the status of global issues in food science and technology. We are pleased that you are joining us in participating in the 14th IUFoST World Congress of Food Science and Technology.

1962年首届世界食品科技大会在英国伦敦举办。46年后，我们很高兴能够在中国的经济金融中心以及最具活力的城市—上海举办第十四届世界食品科技大会。

世界食品科技大会之前仅在三个亚洲城市举办过：1978年在日本京都、1987年在新加坡、2001年在首尔。2008年世界食品科技大会的主题是"食品带来健康与幸福—传统与未来的交融"，作为会议的主办方，中国食品科学技术学会将为我们创造一个利用现代科技和概念了解中国传统饮食文化的机会。

本次大会共设有7个大会报告和6个青年科学家报告，同时，设有14个研讨会，深层次地交流科技热点与行业焦点；4个论坛，深入研讨产业的发展与科技工作者的贡献；28个技术专题研讨涵盖了食品科技与工业的方方面面，包括食品安全、功能食品、食品营养与健康、东方饮食文化与药食同源、新产品开发、可持续发展、食品化学、食品储藏与物流、食品生物技术、食品加工装备等，我相信，本次大会一定能够全面地反映数年来世界食品科技与工业的最新进展，为食品科技与工业的发展提供方向。

本届大会征集的论文数创造历史最高，经过大会学术委员会专家评审，超过2000篇论文摘要被大会接受，其中就包含张贴论文1069篇。另外，在本次大会上首次颁发"IUFoST—食品工业奖"，这是对最近几年来世界食品工业的检阅，也是对未来食品工业发展的一种指引。

除此之外，大会特设的国际食品展，"健康、安全、创新"三大特征得到了食品企业和科研院所的强烈共鸣，面积超过5000平米的展示区域将为数百家知名食品企业以及食品科研院所打造东西方食品科技与产业交融的天堂，为东西方食品业界的交流与合作搭建广阔的平台。

中国上海是一个充满活力的城市，我相信本届大会将会成为各位参会代表终身难忘的经历，期待着在上海相聚！