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**A treaty on animal production and other revisions in the  
Book of Agriculture and Food**

*address to the 95th anniversary of Wageningen University  
and Research Center, 15 March 2013*

I cannot tell you what a great pleasure it is to stand here today to celebrate my alma mater in the presence of the FAO – the two organisations where I have spent most of my professional life. In honour of José Graziano da Silva, let me start with a quote from Brazil's most famous 19<sup>th</sup> century author, Machado de Assis. In his [Memórias Póstumas de Brás Cubas](#) (1881) the writer draws a comparison between the life of man and the editions of a book:

*Each period in life is a new edition that corrects the preceding one and that in turn will be corrected by the next...*

Indeed, every individual life is one of learning and correction. Moreover, this is exactly what happens to mankind as well. Each generation learns from previous mistakes. Each era builds upon past errors and new insight. This is true in every field, from medicine to energy to today's theme of food. One could rewrite human history as a continuous correction course.

In the 19<sup>th</sup> century, during the life of Machado de Assis, we discovered gradually how to harness fossil fuels and to direct our understanding of heredity to the genetic improvement of plants and animals or how hygiene and food preservation worked. Not much later we learnt to capture nitrogen from the air to add into the soil as fertilizer. From the middle of the last century these pieces came together leading to an unprecedented growth of productivity: since the 1960s world population has more than doubled and the average calories per head have grown with more than one quarter.

Nearly without exception, each application of a scientific discovery has led to unforeseen errors or unintended side effects that in turn need correction. Fossil fuels, for example, have led to emissions of CO<sub>2</sub> into the atmosphere, mechanisation still causes erosion and soil compaction, intensification has led to industrial scale rearing of animals at the cost of animal welfare. Nevertheless, our knowledge of feedback loops, at local and global scales, deepens with each adjustment.

Major inefficiencies still exist, for example in the use of agrochemicals leading to unnecessary pollution and to less than optimal growing conditions for crops and livestock. Energy and water efficiencies let alone recycling are still in their infancy in food processing plants, and waste reduction is mostly illusive. These inefficiencies reflect a policy framework that is inadequate: it pays to pollute because we

do not make the polluter pay. Hence, technical knowledge must be matched with political and public support in order to implement sustainable production systems. These are obvious if not always easy corrections.

However, the Book of Agriculture and Food also needs serious revisions, for example the popular assumption that land and population are out of balance causing structural global scarcity. This turns out to be a misleading view. Land availability varies per region with the Middle East and parts of Asia being stretched already, but there are vast underexploited land reserves in Africa, central Asia, Latin America and Eastern Europe. We need to explore where intensification is possible, and where it should be avoided or adapted.

With a few exceptions, population growth rates are declining more rapidly than expected two decades ago. Even China's population will probably decrease within the foreseeable future (but this will not happen yet in India or Africa). Labour will be increasingly scarce, farmers are aging. Hence improving the supply of agricultural products to expanding cities requires smart mechanisation. Mechanisation does not equal large scale and industrial farming. Some of it must be scale-neutral, i.e. adaptable to farms irrespective of their size. Labour efficiencies can be improved with information technology, such as early warning systems for the application of chemical treatments, quality and disease control.

Inevitably, this means that the current 500 million small farmers must receive help to become entrepreneurs rather than remain stuck in subsistence or limited surplus production. Small is not always beautiful in today's Book of Agriculture.

A second revision concerns the concept of food security. The rector already talked about nutrition security, and I could not agree more that nutrition needs to be addressed explicitly. The 1996 World Food Summit defined food security as a situation in which "all people at all times have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences, to lead a healthy and active life". This original definition has lost nothing of its relevance, but nearly twenty years later, we find ourselves in a radically changed world. Now that the great majority of the world population has access to sufficient calories, the time has come to deal more thoroughly with other dimensions.

Firstly, individual food items are less of an issue than the overall food intake pattern. The quality of the entire diet needs to be improved further and consumers need to be enticed to make the right choices. This can only be done through education, diversification, in particular additional proteins, fruits and vegetables. Nearly always this means trade and adequate supply chains. This requires a far more explicit cooperation between government agencies, of

agriculture, health, economic affairs, trade, education, involving the private sector and consumer organisations as well. No country in the world, to my knowledge, has formulated an integrated policy for such cooperation.

Along these lines, I would like to propose, not a reformulation of the definition, but a new operationalisation of food security to incorporate food and nutritional safety into *dietary security and safety*, into a single index of responsible production and consumption patterns and urge countries to design national dietary security and safety strategies. This could be done in the context of the new Sustainable Development Goals and the FAO/WHO ministerial conference on nutrition later this year would be an excellent starting point to provide a draft format.

Let me now turn to the most pressing issue of our times, the provision of animal proteins, the chapter that needs most rewriting. Nobody could have imagined, twenty years ago, the accelerated growth in the demand for meat, eggs and dairy, and to a lesser extent fish, from Asia and other emerging economies. Since 1950 global livestock has grown fivefold and the demand for animal protein may well double in the next decades.

No other issue raises more moral, political and technical questions and leads to greater lack of consumer confidence. Deforestation and habitat destruction for feed and grazing

with potential climate impacts, major veterinary and public health risks from bird flu, obesity, animal welfare and the abhorrence of large scale production – nothing in modern meat production seems right. And even traditional systems are fraught with overgrazing and poor slaughterhouse practices.

Food safety is an ever growing concern: we are plagued by seemingly continuous food scandals, from melamine in Chinese milk to illegal horse meat, E. coli and Salmonella. The excessive preventive use of antibiotics seriously may endanger the supply of medication to human patients. Although our food is safer than ever, these incidents point to structural weaknesses in the production chain, often a combination of inadequate regulation, sloppy compliance and even fraud. Safety in the supply chain and the overall public health risks of high concentrations of animals, in particular pigs and poultry, so close to major urban centres, should worry us greatly.

There are solutions to most of these problems. Physical segregation needs to be enforced, as well as protection of workers. Efficiencies in feed supply are to be addressed, in particular the improvement of nutrient uptake through digestion – in this context the release of transgenic phytase maize in China to reduce phosphate emissions is promising. Antibiotics can be strictly regulated. More can be done to reduce greenhouse gas emissions from livestock. There is

increasingly solid evidence that there are trade-offs between welfare, public health and environment in intensive systems and that not all goals can be met at the same time.

Alternative protein sources, from plants, algae, insects or even bacteria will reduce the demand for food and feed: it is quite possible to substitute up to one third of animal proteins in processed meat in this way without loss of palatability. The use of such resources, including retrieval of proteins from waste, makes perfect ecological sense. Of course, reducing excess meat consumption in countries where protein and essential minerals are not in short supply, through campaigns for a “flexitarian”, low meat diet is a logical step.

But these kinds of measures only work when they are applied everywhere. Across countries, the differential application of animal welfare, labour and safety standards may lead to unequal competition and risk outsourcing production to countries where standards do not apply or are not enforced. This is complicated by the increasing concentration of power in the supply chain as vertical upstream integration takes place. Retailers want to ensure supply through contracts and the acquisition of food processors. This dominance, driven by cost cutting leads to anonymity of suppliers and has replaced the long term contracts, often based on trust, that existed previously. Concentration means that a small group of players determine a large part of the market resulting in a lower prices for producers and potential irresponsible behaviour.

The current lack of a level playing field in terms of public health, animal welfare and GHG emissions is a risk to every consumer with today's international supply chains. There can be no double standards in these matters, not for citizens in countries with adequate regulation who may risk consuming imports from elsewhere, and certainly not for citizens in countries without strict enforcement as they are among the most vulnerable. I believe that the best way to create a level playing field is through open borders and trade, combined with capacity building to bring all countries up to the same standards.

In view of the major risks and societal unrest it becomes urgent to attempt to redesign the global supply of protein to create global standards and enforcement systems, and global systems of traceability and documentation, with clear sanctions for fraud and non-compliance. Knowing your supplier, even if he or she is located at the other side of the globe should be compulsory. Outsourcing can never be an excuse for condoning non-compliance.

Such redesigning can not be achieved unilaterally or by a few countries, but needs to be truly global. The only way forward, in my view, is an international treaty on animal production and protein supply that sets the standards for responsible and sustainable production methods. A round table process could prepare the scope of what I will tentatively call the Treaty for Responsible and Sustainable Animal Production. In



first instance, it seems most feasible to limit the discussions to meat production, of monogastric and polygastric animals, starting possibly with pigs and poultry with the possibility of extending it at a later stage to livestock, dairy, eggs and even fish. Actually, for fish we already have a Code of Responsible Fisheries which does not cover the entire supply chain and is not legally binding.

The experience with the relatively successful round tables on soy bean, palm oil and sustainable biofuels suggest two things: a strong and independent secretariat and the involvement of all stakeholders, science, governments and NGOs. Clearly, I would encourage FAO to take on the secretariat for the negotiations on animal proteins.

Ultimately, I see intergovernmental bodies like the FAO/WHO Codex Alimentarius and the OIE elaborating the standards together with national veterinary and public health agencies, while enforcement may be taken up under the appellate bodies of the WTO, once a treaty is signed.

Yes, this is a major job which will take years, and as someone who has lived through a decade of negotiations on plant genetic resources, I am fully aware of the difficulties. A Treaty on Responsible and Sustainable Animal Production is potentially controversial as it could lead to accusations of protectionism, limitations of free trade and western moralism – hence the need to make it truly global. Perhaps we ought to aim for voluntary guidelines as an intermediate step. The

protein issue is too important and too risky to let laissez-faire and market imperfections take over. Only with equitable access to adequate and affordable protein can we hope to lift the poor, the undernourished and those two billion yet to be born out of misery and guarantee their full participation in society. This is the chapter in the great Book of Agriculture and food that needs the most profound and urgent revision.

Ultimately, we, our livestock, our plants and our cities are part of the grand ecological cycle. Or to complete the earlier quote from Machado de Assis:

*Each period in life is a new edition that corrects the preceding one and that in turn will be corrected by the next --, until publication of the definitive edition -- which the publisher then donates to the worms."*

We are the stuff of worms indeed, and that thought should instil modesty in all of us. But exactly because we are the only species conscious of the global ecological cycles, it is our task to use our scientific understanding fully. We need to be bold and visionary, aware of how we have always learnt from the past. Animal production will not kill the planet as some pessimists fear, but the great Book of Agriculture and Food needs a new chapter and a several serious adjustments so that the next generations can live on a planet that feeds them in a plentiful, equitable and sustainable way.

