



*feeding
the future*



Can
we feed
9 billion
people
in 2050
in a
sustainable
way?

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feeding the future

‘Committing to feeding the world’



When we founded Nutreco in 1994 out of various companies from BP Nutrition, we chose a name to reflect our activities and concerns: **nutrition**, **ecology** and **economy**. These concerns are central today as we face a global challenge. Population numbers are increasing towards nine billion by 2050. Incomes are rising as economies develop. With more money, people consume more protein as meat, fish, milk and eggs — all reliant on animal nutrition. Furthermore, despite over consumption in some regions, many regions still suffer significant undernourishment and malnutrition. Here increased food consumption, including a balance of animal products, is clearly needed. We are challenged to feed this world.

We have to do so more sustainably. The carrying capacity of the world is already over exploited. Food and agriculture are partly responsible. Livestock production, in particular, is regarded as an important contributor to climate change and reduced biodiversity. Consumption of animal products is questioned in some regions because of this. In closing our business conference Agri Vision 2007, I stressed the urgency by estimating that three extra planets would be needed if 9 billion people were to have a Western lifestyle with a meat rich diet. However, it is possible to increase animal production and reduce its environmental impact. Moreover, in a varied balanced human diet, animal products are an efficient source of many vital nutrients such as essential amino acids, vitamins and minerals. For example, vitamin B12 is nearly exclusively present in animal products while minerals such as iron and calcium are more easily absorbed from meat and dairy products respectively than from vegetable sources. In 2008, I participated in the Opening of the Academic Year at Wageningen University and Research Centre in the Netherlands. I had the privilege of sharing the platform with the former Secretary-General of the United Nations, Kofi Annan. He spoke of the need for a green revolution in Africa. Following him, I described the role of animal nutrition in feeding the world. While some view our industry only as part of the problem, this and the experience described below stimulated me to believe we can be part of the solution. Since 1996, we have organised the biennial AquaVision and Agri Vision conferences to provide a neutral forum for all aqua- and agribusiness stakeholders to meet and to discuss strategic issues confronting them and give input for new scenarios. Feeding and fuelling the future world sustainably was the topic in Agri Vision 2009. Leaders in business and science collectively communicated confidence that we can. This booklet intends to share that optimism about the potential to feed the future world sustainably and, hopefully, to generate greater awareness of the urgency for action.



what are
the challenges?

Closing the global gap

THE CHALLENGES – SURGING FOOD DEMAND, STRESSED SURROUNDINGS AND STRUGGLING SUPPLIES

Food production must increase substantially if the predicted population of 2050 is to be fed adequately. That alone is a challenge. Doing it sustainably and with minimal impact on biodiversity is another.

Global warming is happening. Average temperature around 2100 is estimated to increase anywhere from 1.8 to 4 degrees Celsius. It would result in more frequent, intense and longer floods, droughts and heat waves¹ and potentially reduce crop yields in Africa, Asia and Latin America by 20–40%². Moreover, it could put about 20–30% of species at risk of extinction¹. Greenhouse gases (GHG), such as carbon dioxide and methane, are believed to be drivers of global warming and livestock generates greenhouse gases.

Biofuels (bio-ethanol and biodiesel) have been hailed as a key option for the growing need to replace fossil fuels (energy security), mitigate GHG emissions and provide for rural development on a global scale. They are currently the largest new source of alternative demand for agri commodities. US use of corn for ethanol accounted for 35% of the increase in global grain consumption between 2005/06 and 2007/08 versus 28% coming simultaneously from the rising demand

of China and India³. Global production of fuel ethanol tripled between 2000 and 2007 while biodiesel output grew from 1 billion to 11 billion litres⁴.

Reversing the trend of several decades, in 2006 food and agri-commodity prices began rising again. Most even doubled or more. Drivers included growing demand, adverse weather conditions, historically low stocks, biofuel production and government policies. The availability of raw materials was pressured, some were even scarce. Prices have come down since and gone up again, bringing unprecedented volatility, making sourcing of raw materials an important challenge.

The IMF estimated that rising food prices represented about 45% of the global inflation in 2007 and even as much as almost 70% in emerging economies⁵. This especially affected households spending most of their income on food. The world economic crisis followed this year of ‘agflation’ (agriculture induced inflation) resulting in an estimated record high of 1.02 billion people going hungry⁶.

While today more than 1 billion people are undernourished, about the same number is overweight. The challenge is more than producing more; it is sustainably producing more from less and ensuring it is also available to those in need.



**“Every minute,
the world
population is
growing by
more than
150 people⁹.”**

More food will have to be produced over the next decades than has been produced during the past 10,000 years combined⁷

World population is expected to grow from the current 6.9 billion to more than 9 billion in 2050. About 90% of this growth will be in Asia and Africa. On average, those people will live longer. Life expectancy at birth is projected to rise from 68 years today to 76 years in 2045–2050⁸. Today half of all people worldwide live in cities. About the same percentage is poor, living on less than US\$2 a day⁹. In 2050, urbanisation will have increased to 70% of the world population⁹, making more people dependent on fewer farmers for their food. At the same time, per capita incomes are projected to be a multiple of today's¹⁰. With more money to spend, people tend to eat more animal products, notably when income goes above \$2 a day. Food follows the flow of mouths and money. Feeding more than 9 billion wealthier and longer-living mouths in 2050 would require raising overall food production by at least 70%, possibly doubling it¹⁰. Globally, animal protein consumption is expected to double in the first half of this century, towards more than 465 million tons of meat and more than one billion tons of milk. The strongest growth is expected in the consumption of farmed fish and chicken. By convenient coincidence, these also seem to be the animal protein sources with the smallest carbon footprint¹¹.



Jason Clay
*Senior Vice President of
Markets Transformation
WWF*

**“Today some
1.2 billion
people live in
water-scarce
areas.
By 2025,
this number
will rise to
1.8 billion².”**



More from less

We only have one planet. The math is simple. Population times consumption has to have a relationship to this one planet. Right now, the math does not add up. We are currently living at about 1.3 planets. Our global footprint exceeds the world’s capacity to regenerate by about 30%. If we continue like today, we’ll need the equivalent of two planet earths by the mid 2030s. If we would all consume like a US citizen, we would need four extra planets. We don’t have any extra planets. We only have one. We need more from less. We must care for this one planet as if our lives depended on it... because they do!

Agriculture has a big footprint. With farming and ranching, agriculture occupies about 33% of the planet’s land. However, if you take out uninhabitable areas like roads, deserts, lakes, rivers, mountains etc. it adds up to 58%. Agriculture takes about 70% of the global fresh water use, and spoils 60% of it. It takes about three litres water to satisfy our daily drinking needs, but 3,000 litres to produce the equivalent of our daily food¹². FAO’s ‘Livestock’s Long Shadow’ report holds the about 20 billion animals on this planet responsible for about 18% of all greenhouse gas emissions causing global warming. About two-thirds of this (i.e. 13%) comes from extensive livestock production systems such as grazing cattle, sheep and goats. One-third (i.e. about 5%) stems from intensive systems such as pork and poultry¹³.





what are the opportunities?

Potential to gain

OPPORTUNITIES – EFFICIENCY IS KEY

Opportunities exist to increase substantially food available from sustainable agriculture and aquaculture through developing new knowledge via research, through better use of existing knowledge and resources and by reducing waste. Globally, on average more than 20% of all the food that is produced is wasted. In the USA it even is about 30–40%¹⁴. Transport delays and inadequate cold storage in India are estimated to cause 30–40% of perishable products to rot at the production site or while in transit¹⁵.

Implementing best practices can raise global production dramatically. Large variations exist in productivity of farms on land and in water. For example, a difference was found of more than five piglets raised per sow per year between the 20% best and 20% lowest performing pig farms in the Netherlands. Feed conversion ratio, a measure of the efficiency with which the animals use the feed for growth, also varies. For example, the best and worst performing farms in this region had feed conversion ratios around 10% better and 10% worse than the average¹⁶. Similar, or even greater, differences can be found between farms in different countries.

Agriculture and aquaculture can produce far more in the land and water resources sustainably available if we employ the most productive crop varieties and animal breeds and most efficient feeds. Breeding, even by conventional means, still has much to offer in crops and production animals. FAO expects over 75% of the global growth in crop production towards 2050 to come from higher yields¹⁷. Genetic progress in animal breeding could increase by more than 50%¹⁸.

Developments in climate, economics and food and agriculture markets cannot be predicted accurately. We cannot predict the future, but we can prepare. Scenario planning helps to identify shifts in order to prepare for, or shape, the turbulent times ahead. It explores alternative futures and multiple strategies to get there, asking 'what will we do if this happens?' It is used to prepare leaders to anticipate and manage uncertainty. Through scenario planning, challenges can become opportunities for those who are prepared for it and are prepared to act¹⁹. Efficient sustainable use of the available land and water resources can produce more food without depleting finite resources or diminishing biodiversity.



André Faaij
Copernicus Institute –
Faculty of Science,
Utrecht University

**“This
world can
produce
food for
40 billion
people.”**



It is not a food crisis we face; energy crops can help answer the food challenge

Many studies show that the challenge is not in producing enough food but to get investment and development to less developed regions where food production and livestock management can be much more efficient. It is not a food crisis we face; it is a poverty crisis and energy crops can unlock the answer. Energy crops can provide economic progress to areas where it is most needed. Perennial crops especially have good prospects. Bioenergy, second generation biofuels and biomaterials can synergistically link climate mitigation and energy supply with sustainable rural development. In many areas, more productive agriculture is critical to improve food security and to adapt to climate change. Perennial crops can help by restoring and protecting vulnerable soils, while storing large amounts of carbon. Simultaneously, farmers would earn more.

Current analyses show that, around 2050, bioenergy could deliver about one third of global primary energy demand and reduce GHG emissions by a similar share. It would be sustainable and practical land use and include meeting food demand, protecting the forests and biodiversity and take into account that land quality and water availability vary across the globe. Technically, we could go further. Deploying the most efficient and productive farming practices worldwide could, in theory, reduce our footprint of that future world food demand to one fifth of what we have today. So, technically, this world can produce food for 40 billion people, over three times more than meeting our 2050 needs.





Aalt Dijkhuizen
Chairman Executive Board
Wageningen University
and Research Centre

“The social standing and appreciation of farmers should be raised.”



Knowledge: the fourth production factor

Generally, investments in agriculture show high rates of return (30–75%) and long-term benefits². We need to invest to generate new agricultural knowledge. Next to land, labour and capital, knowledge is the fourth production factor. We have to share practical, locally adapted knowledge and turn it into practice. For this we need farmers. The social standing and appreciation of farmers should be raised as they will deliver a significant part of the productivity increase and sustainability gain.

It is important that we practise what we preach and do not preach the practice. Reward results rather than prescribing practices. Practice is not a good proxy for a result. You give a thousand farmers the same practice, you get a thousand different results.

Knowledge needs to be based on science, not superstition. Sound studies can change the debate when they reveal counter-intuitive results. For example, research indicates intensive systems are the way forward. Per kg of product they need the lowest input, emit the least carbon dioxide and have the smallest impact on the environment, though possibly perceived as less animal friendly. Disregarding land use and land use change, current research also shows a much smaller difference in carbon footprint between animal and plant proteins than is commonly assumed. A diet with pork and poultry is hardly more demanding than modern vegetarian meals.



feed-to-food value chain

MONSANTO
imagine®



'One of the greatest challenges of the 21st century is to 'close the gap' between what we produce now and what is needed in the future, while reducing agriculture's

impact on the planet. At Monsanto, we are committed to helping farmers double yields by 2030 in our key crops: soybean, corn, cotton and canola, while using a third less natural resources per unit of output. Increasing yields on existing acres is key to boost production, while protecting natural resources, including land and water. Together with partners, we can make a real difference – for our planet and for farmers around the world.'



The Round Table on Responsible Soy developed sustainability criteria ranging from soil and water management to protection of biodiversity, land and labour rights. The focus now is on implementa-

tion and certification. Field tests are expected to approve the first 0.5-1 million tons of sustainable soya soon. The approach is proving effective, though time-consuming. That is why in the meantime we signed up to a moratorium not to source from newly cleared land in the Amazon biome. With values such as integrity, respect for the environment and our partners, participative management and humility, we actively cooperate to raise sustainability standards.'

PLANT BREEDING

CROP CULTIVATION

ANIMAL NUTRITION

syngenta

'Agricultural technology can increase crop yields at 2% per year, thus outstripping population growth. Crop seeds available today produce yields that are far higher than 15 or 20 years ago and modern breeding can increase yields by a further 15–25%. With products such as Syngenta's drought-resistant corn, we are committed to contributing to food security.'

nutreco

'With over a century of experience, we have been highly inventive and resourceful in feed formulation; realising value from surplus raw materials and by-products. Efficiency is in our genes. We work with others to define and implement carbon footprint standards and sustainable practices. Clear targets have been set to reduce the CO₂ emissions of our operations by half by 2015. We are proud members of the Round Tables on Sustainable Palm Oil and on Responsible Soy. We require our suppliers to respect the Amazon moratorium. Supplier practices we cannot accept include forced labour and child labour, poor health and safety standards and controls.'

copa*cogeca

european farmers european agri-cooperatives

'The challenge for global agriculture is to produce at least 70% more of better quality from fewer inputs. Maintaining competitive sustainability requires productivity gains, including from modern technology. Expected increased market volatility must be addressed to enable farmers to maintain their livelihoods. The farming sector can provide society with long term solutions in combating challenges such as climate change, water management and soil protection. For example, carbon sequestration will drive future cultivation techniques. Farmers need scientific research and, above all, investments in a reasonably stable economic environment to deliver what is expected: increased sustainable production.'

 **Ahold**

'Last year Ahold published information on its carbon footprint, including our direct impact and that of suppliers and consumers. A target was set: 20% reduction per square meter of sales area by 2015. We implemented a seafood sustainability policy based on partnerships, promotion of sustainable seafood and new sourcing rules including the avoidance of over-fished species. Consumers reacted positively and sales rose. Certification schemes, such as the Marine Stewardship Council, help in getting sustainable products onto the shelves but this does not stop us from driving standards into the mainstream. The challenge is not to measure our environmental impact but to change it.'

**MEAT, FISH, DAIRY &
EGG PRODUCTION**

FOOD PROCESSING

RETAIL



marine harvest
excellence in seafood

'Seafood is an important part of a balanced diet and oily fish species such as Atlantic salmon are a rich source of life-essential omega-3 fatty acids. Global demand for fish is growing fast but the harvest of wild fish cannot sustainably be increased. According to FAO, 80% of the world's oceans are fully or over exploited. Aquaculture is closing the supply gap. Currently it provides about 50% of seafood consumed globally and is approaching 10% of total animal protein production. Sustainable development is a precondition for long term value creation and an integral part of our strategic guiding principles.'



Unilever

'Based on sincere belief and commitment, Unilever integrates sustainability in its businesses and brands. Sustainability brings hard business profits. It fuels our innovation pipeline, saves costs and wins customers. Sustainability benefits farmers too. A training project for smallholder tea farmers in Kenya showed a potential 5–15% profit increase through reduced farm inputs and better yields. It is not new. Since 1995, CO₂ from energy for manufacturing is down by 39% and water use by 63%. For tomorrow, Unilever is committed to sourcing 100% of its palm oil and tea for Lipton Yellow Label tea bags from certified sustainable sources by 2015.'



what is the role
of animal nutrition?

Upgrading the value

THE ROLE OF ANIMAL NUTRITION

The challenge for animal nutrition companies is to provide sustainable feeds that enable farmers to meet the rising global demand for highly nutritious protein products — meat, fish, eggs and milk. Current objectives include efficient use of feed raw materials and increasing energy efficiency while reducing waste and pollution including greenhouse gases.

Animal nutrition companies convert low value raw materials into safe animal feeds to provide nutritious food for human consumption. Many of these raw materials would otherwise be less valuable or even left unused. In decreasing order by volume, the major raw materials for land animal feeds come from three broad categories²². Feed grade raw materials that are surplus to demand for food or not appropriate for technical reasons such as wheat not suitable for baking. By-products of the food, drinks and biofuel industries, such as rapeseed meal and brewers' grains. Raw materials produced for feed such as fishmeal and crops from a sustainable rotation, e.g. beans and lupins. On average, FEFAC, the European feed producers' association, estimates that by-products represent 45% of the composition of a conventional pig or poultry diet, at least in Europe²².

R&D improves the utilisation of feed by the animals. Together with optimised feed formulation and farm

management, R&D reduces feed conversion ratios and more protein food is produced per unit of feed. Progress is demonstrated with figures from the past. Whereas 5 kg of feed ingredients were necessary to produce 1 kg of pork in the 1950s, it takes less than 3 kg nowadays. Similarly, less than 2 kg feed input is needed today for 1 kg poultry. For aquaculture overall the ratio of wild fish needed for producing farmed fish is well below one²², meaning that overall less than one kg of wild fish is used for each kg of farmed fish. Even for popular carnivorous species such as Atlantic salmon, the average ratio is approaching one and still decreasing steadily. Better feed efficiency reduces the demand for feed resources, production costs and emissions.

Various raw material combinations are feasible to provide a feed that matches the needs of the animals. Extending raw material options increases this flexibility and reduces demand for those raw materials with limited availability. Feed producers can avoid raw materials in short supply, becoming more expensive, and buy those in surplus, becoming cheaper. In this way, the industry acts as a stabiliser for raw materials prices²².

Animal nutrition is central in the efficient use of agricultural and marine resources: continuously seeking ways of providing more from less.



Leo den Hartog
*Nutreco Director R&D
and Quality Affairs*

**“Worldwide
the productivity
of farm
animals is
30–40%
below their
genetic
potential.”**



Efficiency is key for sustainable food security

We have to double food production while halving the footprint. Efficiency is key for both. With increased efficiency we can produce more from fewer resources and simultaneously emit less. Moreover, a significant share of potential productivity is not used at the moment, as large variation exists in local and global efficiencies. On average, worldwide the productivity of farm animals is 30–40% below their genetic potential because of suboptimal conditions and health status. Sustainable Precision Farming including farm automation, full system control and better management practices, can help to close the gap.

Feed additives such as enzymes and organic acids, increase efficiency. Additives can support the use of low value ingredients and by-products in animal feeds even further, by improving nutrient digestibility or availability. In this way, they allow better use of raw materials, improve feed efficiencies, boost animal health and performance and reduce emissions on land, air and water. Moreover, some specialty products serve to preserve raw materials and finished feeds, reducing waste.

Nutreco is supporting an initiative to develop a standard methodology for calculating greenhouse gas consequences of feeds and feeding strategies. Via the selection of feed raw materials and the way they are produced, processed and transported, we can influence the emissions — during production of the feeds and resulting from their consumption by the animals.





John Brennan
*Nutreco VP, R&D and
Technology Transfer*

“ Modelling gives sustainable guidance

Advanced modelling of the animal's response to nutrients, farming conditions and management at all stages of the lifecycle leads to overall production system optimisation which improves both environmental and financial sustainability of meat, milk and egg production. We must add another dimension, emissions, to existing on-farm optimisations as we strive to produce more food using fewer resources. We have a growing understanding of the quantitative relationships between inputs and outputs on farm. This knowledge is a good foundation upon which to build models and practical solutions that meet both food production and environmental challenges of the next 50 years. ”



Alex Obach
*Director
Skretting Aquaculture
Research Centre*

“ Aquaculture: oceans of opportunities

Over the past few years, we have managed to replace more than 25% of the fish oil, which is limited in supply and expensive, with vegetable oils, without impairing the quality or functionality of our feeds or the quality and taste of the salmon produced. Similar results have been achieved for fishmeal. We have identified ingredients in fishmeal performing essential functions apart from purely nutritional ones. Providing functional ingredients from other sources enables us to reduce fishmeal levels even further and improve feed conversion ratios. Moreover, the smaller amounts of fishmeal and fish oil we do use are sourced from responsibly managed fisheries. And the ambition goes further. It is our goal to play a central role in net fish protein production in salmon farming, producing more fish protein than we have put into the fish feed used. By comparison, it is estimated that wild salmon eat ten times their weight of other fish over their lifespan²².

Aquaculture is expanding with new species. We accumulated knowledge of nutrition for species such as Atlantic salmon and trout for more than 20 years. That experience is accelerating the development of efficient feeds and farming methods for new aquaculture species such as cod and tuna; species that are at risk of overfishing in the wild. ”

A close-up photograph of a person's hand holding a small, vibrant green seedling with two leaves, growing out of a mound of brown soil. The background is a blurred, light brown surface, possibly sand or dry earth. The text "addressing the challenges" is overlaid in white, sans-serif font across the middle of the image.

addressing the challenges

Today for tomorrow

ADDRESSING THE CHALLENGES

To feed the world, production must double by 2050, while halving the footprint, dealing with water constraints, price volatility and the need for more sustainable practices.

However, with more efficient practices, new technologies, and increased levels of partnership, the future of agribusiness can be attractive and rewarding.

Meeting the challenge of feeding the world of 2050 sustainably will require coordinated contributions from many stakeholders. Academics, aquaculture and agribusiness, environmental groups, regulators and politicians need to work together to identify, facilitate and implement the most productive practices, breeds and varieties.

Co-developments are becoming the normal way of doing business. A network of partnerships is required to bring public involvement and acceptance of the paths for progress. The technologies are at hand, but we need to agree on using them.

Such initiatives need initiators, pro-active behaviour, industry leaders. Continuing as you are does not bring opportunities, while being first enables you to set the arena and bring others along.

Technology takes time. If uncertainty is high, as in energy and agriculture, while investment horizons stretch over several years, we need to consider various scenarios to plan ahead. When conditions change, we cannot simply take back an oilfield, a crop field or a planet. We must be ready to act, together. Technology takes time but, more importantly, it takes talent. We are responsible.

Responsibility implies more than producing more from less. Globally a balance must be found; neither over- nor under fed, sustainable and social, sharing investments and knowledge to increase food production in those regions where it is most needed. Awareness and a moral compass are as important as technology and efficiency.



Rudy Rabbinge
*Professor Sustainable
Development
& Food Security*
Wageningen University
and Research Centre

**“We should
not put taboos
on fertilisers,
pesticides
or genetic
modification.”**



Most crops perform 50% below their optimum

There is much potential to gain from increasing efficiency and productivity globally. Most crops perform 50% below their optimum. Whereas the world average cereals yield is about three tons per ha, the ten countries with the largest area of harvested cereals show productivities ranging from over six tons per ha in the US to about one ton per ha in Nigeria and Kazakhstan. For comparison, the highest cereals yields are eight to ten tons per ha²⁰. Moreover, the yield gap between the most and least productive farming systems increased twentyfold between 1950 and 2000²¹. If the worst producers of any crop in the world produced at the global average, we would not face even a potential food crisis in 2050.

Though appreciating organic agriculture, it cannot by itself feed the rapidly growing population. We should not put taboos on fertilisers, pesticides or genetic modification. Doing so will be at the cost of natural habitats because much more land will be needed to feed the world. Ecological dogmatism is counterproductive for the widely accepted societal goals for sustainable development and food security. Ecological literacy is needed to make maximal use of knowledge and understanding. This will lead to food security, efficient water use, safeguarding natural resources and ample space for biodiversity.

We cannot feed today's world with yesterday's agriculture. We certainly cannot feed the world of tomorrow with the agriculture of today.

However, highly productive sustainable agriculture can feed a multiple of today's world population.





Louise Fresco
Professor at the University of Amsterdam and Crown member of the Social and Economic Council of the Netherlands

“Food is about respect for nature and for its producers.”



There is no technical reason why we could not feed a world of nine billion people

Today, more food is available than ever before in human history, yet never before has the responsibility to feed the world been in the hands of so few. Never before have so many had the luxury of taking food for granted because it is plentiful and cheap. Although some people may idealise the past, a return to small scale farming is not a solution to feed the world. Nor is exclusively local food production feasible. We will continue to live a globalised world, but probably one with stronger regionalisation. Food production has to double by 2050. As agricultural labour will become more limited, we need mechanisation on a human scale. The challenge will be to encourage small farmers to become entrepreneurs. For this we need science-based intensification that makes ecological sense. As societies become more urbanised we must regain an understanding of where our food comes from. Food should not be seen as a functional commodity, easily disposed of or wasted. Food is about respect for nature and for its producers. We also should be aware of how privileged we are as many people still struggle for their daily food. Chronic hunger and obesity co-exist. I plead for moderation, for moral responsibility, for bringing back solidarity in our thoughts and actions. Food is about sharing.

Can we feed the world? The answer is emphatically: Yes, we can. There is no technical reason why we could not feed a world of nine billion people. Hunger is a matter of buying power, not of shortages.



From left to right:

Aalt Dijkhuizen, *Chairman Executive Board Wageningen University and Research Centre*,
Wout Dekker, *CEO Nutreco* & **Kofi Annan**, *Former Secretary-General UN* at the Opening of
the Academic Year 2008-2009 of Wageningen University and Research Centre



**“Agriculture is
the core sector
of economic
growth.”**

“A Green Revolution can free Africa from hunger in 10 years.”

We need to start today

We need not wait for tomorrow's breakthroughs. The policies, the science and the green technologies at our disposal today can begin to do the job. With concerted action in five areas — water, energy, health, agriculture and biodiversity — progress could be far quicker than is commonly believed. Progress is needed fast, especially in Africa. The African continent combines the greatest need with the greatest potential. Due to the vast area of land that can be brought into production and a possible even five times higher productivity, there is a lot of potential to gain in Africa. Partnerships and policies are key to unlock this potential — resilient and flexible partnerships and policies that support more productive farming along with improving infrastructure, access to global markets and credit for the majority of Africa's smallholder farmers: women. Agriculture is vital to successful progress. It is the core sector of economic growth. Almost no country has managed a rise from poverty without increasing agricultural productivity. According to FAO, cross-country analysis shows that overall GDP growth originating in agriculture is, on average, at least twice as effective in benefiting the poorest half of a country's population as growth generated in non-agricultural sectors¹⁰. As we had in Europe, the Americas and lately in Asia, we need a Green Revolution in Africa that can free Africa from hunger in 10 years time.

‘Doubling food production while halving the footprint’

by Wout Dekker, CEO Nutreco



The challenge is clear. We must produce more food more sustainably — more from less. Efficiency is key; delivering more from limited resources and simultaneously reducing emissions to land, air and water. The potential to sustainably increase efficiency and productivity is there. It lies in generating and disseminating both new and existing knowledge. It lies in reducing the gap between least and most productive systems. Globally, the average productivity of farm animals can already be increased by 30–40% by implementing existing knowledge and best practices. It lies in saving energy and food by reducing waste. It lies in all options available, and we cannot leave any option off the table.

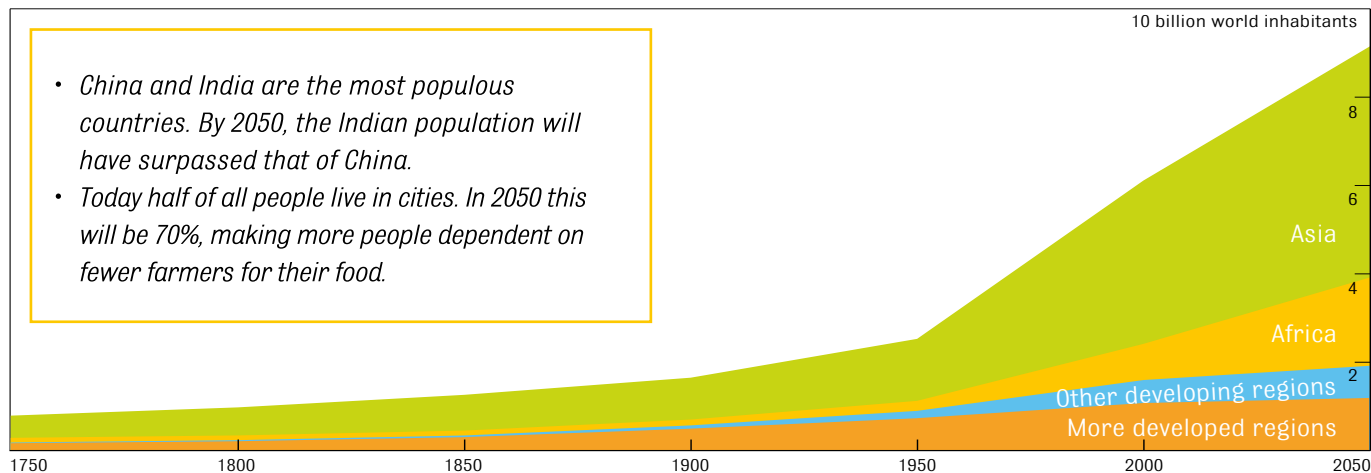
RENEWED APPRECIATION FOR FARMERS We need to invest more in food and agriculture as this is vital to sustainable economic growth. The awareness and urge are here. The recent food crisis deservedly brought renewed attention and appreciation for farmers and agri-technologies as a means of ensuring sustainable food security. We need to invest in science to be able to measure, monitor and modify for improvement. We need internationally accepted sustainability standards. Here, governments can play an important stimulating role. These standards will provide valid incentives to steer agriculture and food production towards lower footprints.

PARTNERS We cannot do it alone. Success is only feasible if you are willing to share — willing to share knowledge, best practices, investments and risks but also dilemmas. We need all stakeholders to come along. We need partners. As an animal nutrition specialist, we realise that our own direct impact on emissions represents only a small part of the whole footprint of the value chains we operate in. We need all stakeholders in the food and agribusiness to take real actions towards the goal of halving livestock's footprint while doubling its production. Although we do not have full control, we have responsibility.

FEEDING THE FUTURE Nutreco feels responsible. We are determined and passionate to make a positive contribution. Operating at the critical junction between raw materials and animal protein production, we apply our long tradition of animal nutrition knowledge to upgrade low value raw materials into feeds that produce

We aim to do more — more for tomorrow. In 2010 Nutreco will publish its tenth Sustainability Report. For the first time, we will incorporate sustainability targets in the contracts of our managers, including clear targets to reduce the CO₂ emissions of our operations by half by 2015. Sustainability is becoming part of our business model.

World population growth from 1750 to 2050



UN ESA, 2004 and UN ESA World Population Prospects, The 2008 Revision (medium variant)

the meat, fish, milk and eggs that consumers demand. We do this as efficiently as possible. Next to their economic and nutritional value, we are developing sustainability values for our feed ingredients. We actively participate in scientific research and in sustainability initiatives such as the Round Table on Responsible Soy. We adapted our sourcing policies, e.g. requiring our suppliers to respect the Amazon moratorium.

‘Feeding the Future’ is the essence of Nutreco. It was chosen by our employees as our new slogan urging management to make a change. It aligns and inspires our people and directs all our activities to provide more from less, for today, tomorrow and beyond.

I sincerely hope that this booklet has been able to transfer the optimism, inspiration and commitment of many stakeholders in our industry towards feeding the world sustainably. Aqua- and agriculture will have no choice but to be more productive and we can be: ‘Feeding the Future’ — together we can sustainably feed the world of tomorrow but we have to start today.

Profile

NUTRECO IS A GLOBAL LEADER IN ANIMAL NUTRITION AND FISH FEED

Our advanced feed solutions are at the origin of food for millions of consumers worldwide. Quality, innovation and sustainability are guiding principles, embedded in the Nutreco culture from research and raw material procurement to products and services for agriculture and aquaculture. Experience across 100 years brings Nutreco a rich heritage of knowledge and experience for building its future. Nutreco employs 9,900 people in 30 countries, with sales in 80 countries. Headquartered in the Netherlands, Nutreco is listed on the Euronext stock exchange in Amsterdam and has annual revenues of approximately 4.5 billion.

*feeding
the future*

Vision

In a world with limited natural resources and a growing population, Nutreco plays a leading role in developing and supplying the most efficient and sustainable feed solutions.

Mission

Nutreco is a global leader in animal nutrition. We deliver high-quality and sustainable feed solutions and add value to our customers' businesses by developing and supplying innovative products and concepts that support the best performance of farmed animals and fish.

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