metals, hormones, antibiotics and various addi-
tives in the food system as well as those related to
large-scale livestock farming. Strengthened food
safety measures are important and necessary in
both domestic and export markets, but can impose
significant costs. Some countries may need help in
meeting food control costs such as monitoring and
inspection, and costs associated with market rejec-
tion of contaminated or otherwise unsafe commodi-
ties and food products.

### Occupational Health

Worldwide, agriculture accounts for at least 170,000
occupational deaths each year; in other words, half
of all fatal occupational accidents. This is twice the
average accident rate for other industries. Machin-
ery and equipment, such as tractors and harvesters,
account for the highest rates of injury and death,
particularly among rural laborers. Other important
health hazards include agricultural poisoning, transmigrable animal diseases, toxic or allergic agents,
and noise, vibration and ergonomic haz-
ard. The World Health Organization estimates that
there are between two and five million cases of pe-
teicide poisoning each year affecting pesticide appli-
cators and rural communities.

Improving occupational and public health requires
a greater emphasis on health protection through
development and enforcement of health and safety
regulations including international treaties to phase
out and ban highly hazardous pesticides. Policies
and regulations including international treaties to phase
development and enforcement of health and safety
promoting strategies and measures. Promote
policies and programs to improve mi-
nicronutrient intake and diversify diets. Increase
food safety via effective, coordina-
ted and proactive national and international
food safety systems; legislative frameworks for
identification and control of biological and
chemical hazards; and farmer-scientist part-
nerships for the identification, monitoring and
evaluation of risks. Support policies that explicitly recognize the
importance of improving human health and
nutrition, including regulation of food product
formulation and pesticides in foods; drinking
water; international agreements and regu-
lations for food labeling and health claims; and
creation of incentives for the production and
consumption of healthy foods.

Strengthen the capacity of agricultural, vet-
erinary, and public health systems to reduce the
spread of infectious diseases, reduce ex-
posure to immune-compromising factors and toxins, and
develop and deploy ARV to identify, monitor, prevent, control and treat dis-
tases.

Promote occupational and public health by
developing and enforcing health and safety
regulations (including pesticide regulations),
ensuring cross-border regulations regarding
regional and export toxic occupa-
tional and food safety measures are necessary and
important in both domestic and export markets, but can impose
significant costs. Some countries may need help in
meeting food control costs such as monitoring and
inspection, and costs associated with market rejec-
tion of contaminated or otherwise unsafe commodi-
ties and food products.

### Practices and policies for moving to

- An integrated agroecosystem and human
  health approach to increase food se-
 curity and
  safety, decrease the incidence and prevalence of
  infectious and chronic diseases, and de-
  crease occupational injuries, illnesses and
d deaths.
- Invest in robust agricultural, public health, and
  veterinary detection, surveillance, monitor-
ing and response systems to identify the true
  burden of ill health and cost-effective, health-
  promoting strategies and measures.
- Promote policies and programs to improve mi-
nicronutrient intake and diversify diets.
- Increase food safety via effective, coordina-
ted and proactive national and international
  food safety systems; legislative frameworks for
  identification and control of biological and
  chemical hazards; and farmer-scientist part-
nerships for the identification, monitoring and
evaluation of risks.
- Support policies that explicitly recognize the
  importance of improving human health and
  nutrition, including regulation of food product
  formulation and pesticides in foods; drinking
  water; international agreements and regu-
lations for food labeling and health claims; and
  creation of incentives for the production and
  consumption of healthy foods.

Strengthen the capacity of agricultural, vet-
erinary, and public health systems to reduce the
spread of infectious diseases, reduce ex-
posure to immune-compromising factors and toxins, and
develop and deploy ARV to identify, monitor, prevent, control and treat dis-
tases.

Promote occupational and public health by
developing and enforcing health and safety
regulations (including pesticide regulations),
ensuring cross-border regulations regarding
regional and export toxic occupa-
tional and food safety measures are necessary and
important in both domestic and export markets, but can impose
significant costs. Some countries may need help in
meeting food control costs such as monitoring and
inspection, and costs associated with market rejec-
tion of contaminated or otherwise unsafe commodi-
ties and food products.

### Practices and policies for moving to

- An integrated agroecosystem and human
  health approach to increase food se-
 curity and
  safety, decrease the incidence and prevalence of
  infectious and chronic diseases, and de-
  crease occupational injuries, illnesses and
d deaths.
- Invest in robust agricultural, public health, and
  veterinary detection, surveillance, monitor-
ing and response systems to identify the true
  burden of ill health and cost-effective, health-
  promoting strategies and measures.
- Promote policies and programs to improve mi-
nicronutrient intake and diversify diets.
- Increase food safety via effective, coordina-
ted and proactive national and international
  food safety systems; legislative frameworks for
  identification and control of biological and
  chemical hazards; and farmer-scientist part-
nerships for the identification, monitoring and
evaluation of risks.
- Support policies that explicitly recognize the
  importance of improving human health and
  nutrition, including regulation of food product
  formulation and pesticides in foods; drinking
  water; international agreements and regu-
lations for food labeling and health claims; and
  creation of incentives for the production and
  consumption of healthy foods.

Strengthen the capacity of agricultural, vet-
erinary, and public health systems to reduce the
spread of infectious diseases, reduce ex-
posure to immune-compromising factors and toxins, and
develop and deploy ARV to identify, monitor, prevent, control and treat dis-
tases.

Promote occupational and public health by
developing and enforcing health and safety
regulations (including pesticide regulations),
ensuring cross-border regulations regarding
regional and export toxic occupa-
tional and food safety measures are necessary and
important in both domestic and export markets, but can impose
significant costs. Some countries may need help in
meeting food control costs such as monitoring and
inspection, and costs associated with market rejec-
tion of contaminated or otherwise unsafe commodi-
ties and food products.

### Practices and policies for moving to

- An integrated agroecosystem and human
  health approach to increase food se-
 curity and
  safety, decrease the incidence and prevalence of
  infectious and chronic diseases, and de-
  crease occupational injuries, illnesses and
d deaths.
- Invest in robust agricultural, public health, and
  veterinary detection, surveillance, monitor-

population, because ill health in childhood can affect and infectious disease among the young has impor
tious diseases, causing nearly 3.6 million deaths,
ty for those at risk of undernourishment. Demand for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in 2010 and 74 million in 2015. Two-thirds of those
in 2020, 60% of the disease burden in develop

availability in developing coun
grow faster in low- and middle-income countries. More sedentary, urbanized lifestyles are expected to contribute to the trend. In addition, the overall large
in calorie availability in developing coun
test at two kilos of grain to pro-

chronic diseases account for nearly

serers. These chronic diseases account for nearly

increase in calorie availability in developing coun

more families without provid

chronic diseases, and epidemic zoonotic disease, e.g.,

serous infections, have also been shown to be associated

tics, such as various cancers and neurological,

and economic access to sufficient safe, nu-

nations, 2003 estimates. Source: Rosegrant et al., 2006

roughly 40% of the world’s grain supply is con-

and to account for an estimated 2.1 million deaths

several attributed to diarrhea, pneumonia,

more sedentary, urbanized lifestyles are expected to

in 2010 and 2015. Those countries with large populations, particularly in Asia and sub-Saharan Africa, will continue, if not intensify, this century. The increase in

growth of international trade), social factors (chang

labor losses will be in Africa. Fewer workers mean

diseases spread widely within human or animal

serious socioeconomic impacts can occur when
dietary needs. An adequate intake of calories does

does not ensure that the need

cultivate adequate food. Irregular and poor quality
income countries.

insecurity, as it undermines rural families’ ability to

tics, such as various cancers and neurological,

malnutrition.

Undernutrition

more families without provid

underweight due to wash-

indicating acute weight loss) or

stunting (i.e., low height-for-age, indicating chronic

Undernutrition in children is responsible for an in-

in 2011. Two-thirds of those labor losses will be in Africa. Fewer workers mean

chronic and infectious diseases, and epidemic zoonotic disease, e.g.,

in the past will

chronic diseases and immune-suppressive condi-

ity for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in 2010 and 74 million in 2015. Two-thirds of those

challenges for the next decades will be
to ensure safe food and raise the quality of life with-

serous infections, have also been shown to be associated

and to account for an estimated 2.1 million deaths

more sedentary, urbanized lifestyles are expected to

in 2020, 60% of the disease burden in develop

more families without provid

underweight due to wast

in 2010 and 74 million in 2015. Two-thirds of those

chronic diseases and immune-suppressive condi-

serious socioeconomic impacts can occur when
dietary needs. An adequate intake of calories does

does not ensure that the need

Undernutrition

in 2011. Two-thirds of those labor losses will be in Africa. Fewer workers mean

chronic and infectious diseases, and epidemic zoonotic disease, e.g.,

in the past will

chronic diseases and immune-suppressive condi-

ity for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in 2010 and 74 million in 2015. Two-thirds of those

challenge. The number of at-risk deaths or death from

serious socioeconomic impacts can occur when
dietary needs. An adequate intake of calories does

does not ensure that the need

Undernutrition

in 2011. Two-thirds of those labor losses will be in Africa. Fewer workers mean

chronic and infectious diseases, and epidemic zoonotic disease, e.g.,

in the past will

chronic diseases and immune-suppressive condi-

ity for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in 2010 and 74 million in 2015. Two-thirds of those

challenge. The number of at-risk deaths or death from

serious socioeconomic impacts can occur when
dietary needs. An adequate intake of calories does

does not ensure that the need

Undernutrition

in 2011. Two-thirds of those labor losses will be in Africa. Fewer workers mean

chronic and infectious diseases, and epidemic zoonotic disease, e.g.,

in the past will
Food insecurity arises when people do not have physical and economic access to sufficient safe, nutritious and culturally acceptable food to meet their dietary needs. An adequate intake of calories does not ensure that the need for micronutrients has been met. Being underweight due to wasting (i.e., low weight-for-height, indicating acute weight loss) or stunting (i.e., low height-for-age, indicating chronic growth failure) only approximately 852 million people around the world are unable to obtain enough food to lead healthy and productive lives.

Undernutrition in children is responsible for an estimated 30% of deaths in children under five years of age. Approximately 48 million children under five years of age are underweight, 9 million children under five years of age are wasted, and 19 million children under five years of age are stunted. Approximately 55% of the global burden of disease young people are attributable to infectious diseases, with the burden of Communicable Diseases being the primary cause for the undernutrition/poor health/low productivity cycle. In the past, pathogens that infect more than one host species are more likely to emerge than those that target a single host species. Factors driving disease emergence include intensification of crop and livestock systems, economic factors (e.g., expansion of international trade), social factors (changing diets and lifestyles), demographic factors (e.g., population growth), environmental factors (e.g., land-use changes and climate change), and microbial evolution. Most of the factors that have contributed to disease emergence in the past will continue, if not intensify, this century. The increase in disease emergence will affect both high- and low-income countries.

Serious socioeconomic impacts can occur when diseases spread widely within human or animal populations, or when they spill over from animal to human hosts. Animal diseases also affect animal and welfare. They influence perceptions of food safety; result in trade restrictions; adversely affect economic growth; and non-tradable rural industries; have detrimental environmental effects; and adversely affect national economies in countries heavily dependent on agriculture. Even small-scale animal disease outbreaks can have major economic impacts in pastoral communities.

Food Safety
Foodborne diseases are estimated to affect 30% of the global population and result in an estimated 2.1 million deaths in developing countries. More than 200 known diseases are transmitted by food, but the true burden of foodborne diseases is obscured by under-reporting, diseases caused by unknown pathogens, and other factors. The proportion of the population at high risk of death or disease from foodborne pathogens is increasing in many countries due to increasing age, the prevalence of chronic diseases and immuno-suppressive conditions. The need for strict food safety standards from the farm to the table has been highlighted by a wide range of sanitary and phytosanitary issues, including well-publicized outbreaks of BSE, hoof-and-mouth disease, avian influenza, salmonella and E. coli; acute poisonings and deaths associated with pesticide residues; and concerns regarding the effects of genetically modified organisms and to undernutrition when grain production is insufficient or distributed in ways that affect food availability for those at risk of undernutrition. Demand for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in South America and Russia, and remain constant in the former Soviet Union to OECD levels, and remain essentially the same in most OECD countries.

Infectious Diseases
Communicable diseases are the primary cause for variations in life expectancy across countries. AKST is important in several broad categories of infectious diseases whose incidence is affected by agricultur al systems and practices, e.g., malaria and bovine spongiform encephalopathy (BSE), foodborne zoonotic diseases, and epidemic zoonotic disease, e.g., avian influenza.

In the future, pathogens that infect more than one host species are more likely to emerge than those that target a single host species. Factors driving disease emergence include intensification of crop and livestock systems, economic factors (e.g., expansion of international trade), social factors (changing diets and lifestyles), demographic factors (e.g., population growth), environmental factors (e.g., land-use changes and climate change), and microbial evolution. Most of the factors that have contributed to disease emergence in the past will continue, if not intensify, this century. The increase in disease emergence will affect both high- and low-income countries.

Serious socioeconomic impacts can occur when diseases spread widely within human or animal populations, or when they spill over from animal to human hosts. Animal diseases also affect animal and welfare. They influence perceptions of food safety; result in trade restrictions; adversely affect economic growth; and non-tradable rural industries; have detrimental environmental effects; and adversely affect national economies in countries heavily dependent on agriculture. Even small-scale animal disease outbreaks can have major economic impacts in pastoral communities.

Food Safety
Foodborne diseases are estimated to affect 30% of the global population and result in an estimated 2.1 million deaths in developing countries. More than 200 known diseases are transmitted by food, but the true burden of foodborne diseases is obscured by under-reporting, diseases caused by unknown pathogens, and other factors. The proportion of the population at high risk of death or disease from foodborne pathogens is increasing in many countries due to increasing age, the prevalence of chronic diseases and immuno-suppressive conditions. The need for strict food safety standards from the farm to the table has been highlighted by a wide range of sanitary and phytosanitary issues, including well-publicized outbreaks of BSE, hoof-and-mouth disease, avian influenza, salmonella and E. coli; acute poisonings and deaths associated with pesticide residues; and concerns regarding the effects of genetically modified organisms and to undernutrition when grain production is insufficient or distributed in ways that affect food availability for those at risk of undernutrition. Demand for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in South America and Russia, and remain constant in the former Soviet Union to OECD levels, and remain essentially the same in most OECD countries.

Infectious Diseases
Communicable diseases are the primary cause for variations in life expectancy across countries. AKST is important in several broad categories of infectious diseases whose incidence is affected by agricultural systems and practices, e.g., malaria and bovine spongiform encephalopathy (BSE), foodborne zoonotic diseases, and epidemic zoonotic disease, e.g., avian influenza.

In the future, pathogens that infect more than one host species are more likely to emerge than those that target a single host species. Factors driving disease emergence include intensification of crop and livestock systems, economic factors (e.g., expansion of international trade), social factors (changing diets and lifestyles), demographic factors (e.g., population growth), environmental factors (e.g., land-use changes and climate change), and microbial evolution. Most of the factors that have contributed to disease emergence in the past will continue, if not intensify, this century. The increase in disease emergence will affect both high- and low-income countries.

Serious socioeconomic impacts can occur when diseases spread widely within human or animal populations, or when they spill over from animal to human hosts. Animal diseases also affect animal and welfare. They influence perceptions of food safety; result in trade restrictions; adversely affect economic growth; and non-tradable rural industries; have detrimental environmental effects; and adversely affect national economies in countries heavily dependent on agriculture. Even small-scale animal disease outbreaks can have major economic impacts in pastoral communities.

Food Safety
Foodborne diseases are estimated to affect 30% of the global population and result in an estimated 2.1 million deaths in developing countries. More than 200 known diseases are transmitted by food, but the true burden of foodborne diseases is obscured by under-reporting, diseases caused by unknown pathogens, and other factors. The proportion of the population at high risk of death or disease from foodborne pathogens is increasing in many countries due to increasing age, the prevalence of chronic diseases and immuno-suppressive conditions. The need for strict food safety standards from the farm to the table has been highlighted by a wide range of sanitary and phytosanitary issues, including well-publicized outbreaks of BSE, hoof-and-mouth disease, avian influenza, salmonella and E. coli; acute poisonings and deaths associated with pesticide residues; and concerns regarding the effects of genetically modified organisms and to undernutrition when grain production is insufficient or distributed in ways that affect food availability for those at risk of undernutrition. Demand for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in South America and Russia, and remain constant in the former Soviet Union to OECD levels, and remain essentially the same in most OECD countries.

Infectious Diseases
Communicable diseases are the primary cause for variations in life expectancy across countries. AKST is important in several broad categories of infectious diseases whose incidence is affected by agricultural systems and practices, e.g., malaria and bovine spongiform encephalopathy (BSE), foodborne zoonotic diseases, and epidemic zoonotic disease, e.g., avian influenza.

In the future, pathogens that infect more than one host species are more likely to emerge than those that target a single host species. Factors driving disease emergence include intensification of crop and livestock systems, economic factors (e.g., expansion of international trade), social factors (changing diets and lifestyles), demographic factors (e.g., population growth), environmental factors (e.g., land-use changes and climate change), and microbial evolution. Most of the factors that have contributed to disease emergence in the past will continue, if not intensify, this century. The increase in disease emergence will affect both high- and low-income countries.

Serious socioeconomic impacts can occur when diseases spread widely within human or animal populations, or when they spill over from animal to human hosts. Animal diseases also affect animal and welfare. They influence perceptions of food safety; result in trade restrictions; adversely affect economic growth; and non-tradable rural industries; have detrimental environmental effects; and adversely affect national economies in countries heavily dependent on agriculture. Even small-scale animal disease outbreaks can have major economic impacts in pastoral communities.

Food Safety
Foodborne diseases are estimated to affect 30% of the global population and result in an estimated 2.1 million deaths in developing countries. More than 200 known diseases are transmitted by food, but the true burden of foodborne diseases is obscured by under-reporting, diseases caused by unknown pathogens, and other factors. The proportion of the population at high risk of death or disease from foodborne pathogens is increasing in many countries due to increasing age, the prevalence of chronic diseases and immuno-suppressive conditions. The need for strict food safety standards from the farm to the table has been highlighted by a wide range of sanitary and phytosanitary issues, including well-publicized outbreaks of BSE, hoof-and-mouth disease, avian influenza, salmonella and E. coli; acute poisonings and deaths associated with pesticide residues; and concerns regarding the effects of genetically modified organisms and to undernutrition when grain production is insufficient or distributed in ways that affect food availability for those at risk of undernutrition. Demand for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in South America and Russia, and remain constant in the former Soviet Union to OECD levels, and remain essentially the same in most OECD countries.

Infectious Diseases
Communicable diseases are the primary cause for variations in life expectancy across countries. AKST is important in several broad categories of infectious diseases whose incidence is affected by agricultural systems and practices, e.g., malaria and bovine spongiform encephalopathy (BSE), foodborne zoonotic diseases, and epidemic zoonotic disease, e.g., avian influenza.

In the future, pathogens that infect more than one host species are more likely to emerge than those that target a single host species. Factors driving disease emergence include intensification of crop and livestock systems, economic factors (e.g., expansion of international trade), social factors (changing diets and lifestyles), demographic factors (e.g., population growth), environmental factors (e.g., land-use changes and climate change), and microbial evolution. Most of the factors that have contributed to disease emergence in the past will continue, if not intensify, this century. The increase in disease emergence will affect both high- and low-income countries.

Serious socioeconomic impacts can occur when diseases spread widely within human or animal populations, or when they spill over from animal to human hosts. Animal diseases also affect animal and welfare. They influence perceptions of food safety; result in trade restrictions; adversely affect economic growth; and non-tradable rural industries; have detrimental environmental effects; and adversely affect national economies in countries heavily dependent on agriculture. Even small-scale animal disease outbreaks can have major economic impacts in pastoral communities.

Food Safety
Foodborne diseases are estimated to affect 30% of the global population and result in an estimated 2.1 million deaths in developing countries. More than 200 known diseases are transmitted by food, but the true burden of foodborne diseases is obscured by under-reporting, diseases caused by unknown pathogens, and other factors. The proportion of the population at high risk of death or disease from foodborne pathogens is increasing in many countries due to increasing age, the prevalence of chronic diseases and immuno-suppressive conditions. The need for strict food safety standards from the farm to the table has been highlighted by a wide range of sanitary and phytosanitary issues, including well-publicized outbreaks of BSE, hoof-and-mouth disease, avian influenza, salmonella and E. coli; acute poisonings and deaths associated with pesticide residues; and concerns regarding the effects of genetically modified organisms and to undernutrition when grain production is insufficient or distributed in ways that affect food availability for those at risk of undernutrition. Demand for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in South America and Russia, and remain constant in the former Soviet Union to OECD levels, and remain essentially the same in most OECD countries.
Infectious Diseases

Communicable diseases are the primary cause for variations in life expectancy across countries. AKST is important in broad categories of infectious diseases whose incidence is affected by agricultural systems and practices, e.g., malaria and bovine spongiform encephalopathy (BSE), foodborne zoonotic diseases, and epidemic zoonotic disease, e.g., avian influenza.

In the future, pathogens that infect more than one host species are more likely to emerge than those that target a single-host species. Factors driving disease emergence include intensification of crop and livestock systems, economic factors (e.g., expansion of international trade), social factors (changing diets and lifestyles), demographic factors (e.g., population growth), environmental factors (e.g., land-use change and climate change), and microbial evolution. Most of the factors that have contributed to disease emergence in the past will continue, if not intensify, this century. The increase in disease emergence will affect both high- and low-income countries.

Serious socioeconomic impacts can occur when diseases spread widely within human or animal populations, or when they spill over from animal to human hosts. Animal diseases also affect animal and welfare. They influence perceptions of food safety, result in trade restrictions; adversely affect national economic performance and non-farm rural industries; have detrimental environmental effects; and adversely affect national economies in countries heavily dependent on agriculture. Even small-scale animal disease outbreaks can have major economic impacts in pastoral communities.

Proportion of the population unable to acquire sufficient calories to meet their daily caloric requirements.

Almost 652 million people around the world are unable to obtain enough food to lead healthy and productive lives.

Almost 3.5 million people die each year from hunger and undernutrition, because ill health in childhood can affect an individual’s physical and mental development, susceptibility to disease, and capacity for work. The HIV/AIDS epidemic is a compelling example of the interactions among poverty, illness, food insecurity, and undernutrition. HIV/AIDS have become a major factor in the pervasiveness of food insecurity, as it undermines rural families’ ability to cultivate adequate food. Insufficient dietary quality and nutrition, in turn, hinders the AIDS of those weakened by HIV and increases vulnerability to opportunistic infections. The global labor force had lost 28 million economically active people to AIDS by 2005, a number expected to increase to 48 million in 2010 and 74 million in 2015. Two-thirds of those labor losses will be in Africa. Poorer workers are more families without providers, more children without parents, and the loss of transmission of knowledge, skills, and values from one generation to the next.

Chronic Diseases

Overnutrition is associated with increasing rates of worldwide obesity and chronic diseases, including heart diseases, diabetes, stroke, and lung cancer. These chronic diseases account for nearly half of the global burden of disease, with the burden growing fastest in low- and middle-income countries. More sedentary, urbanized lifestyles are expected to contribute to the trend. In addition, the overall large increase in calorie availability in developing countries is expected to further increase the prevalence of obesity and associated diseases. It is estimated that by 2020, 30% of the disease burden in developing countries will result from non-communicable diseases exacerbated by obesity. Chronic health conditions, such as various cancers and neurological, developmental, reproductive, and endocrine-disrupting effects, have also been shown to be associated with exposure to chemical pesticides.

Roughly 40% of the world’s grain supply is consumed in animal feed, with grain-to-livestock ratios conservatively estimated at two kilos of grain to produce one kilo of chicken, four kilos to produce one kilo of beef, and seven kilos to produce one kilo of beef. Increased consumption of animal protein contributes to the burden of chronic disease as well as to undernutrition when grain production is insufficient or distributed in ways that affect food availability for those at risk of undernutrition. Demand for livestock products is projected to double by 2050 in sub-Saharan Africa and South Asia, increase in South America, and stay roughly the same in the former Soviet Union to OECD levels, and remain essentially the same in most OECD countries.

Seafood Foodborne diseases are estimated to affect 30% of the population in the developed world and to account for an estimated 2.1 million deaths in developing countries. More than 200 known diseases are transmitted by food, but the true burden of foodborne diseases is obscured by under-reporting, illnesses caused by unknown pathogens, and other factors. The proportion of the population at risk of death or death from foodborne pathogens is increasing in many countries due to increasing age, the prevalence of chronic diseases and immune-suppressive conditions. The need for strict food safety standards from the farm to the table has been highlighted by a wide range of sanitary and phytosanitary issues, including well-publicized outbreaks of BSE, hoof-and-mouth disease, avian influenza, salmonella and E. coli; acute poisonings and deaths associated with pesticide residues; and concerns regarding the effects of genetically modified organisms on human health. A consistent concern is that there is no adequate mechanism for financing the public health costs resulting from trans-border foodborne diseases. Challenges for the next decades will be to ensure safe food and raise the quality of life without creating market entry barriers to agricultural exports from poor countries.

Globalization of the food supply, accompanied by market share concentration of food distribution and processing companies and growing consumer awareness increase the need for effective, coordinated and proactive national food safety systems.

Health concerns that could be addressed by AKST include the presence of pesticide residues, heavy
Practices and policies for moving to food security must explicitly address tradeoffs between livelihoods and environment. Governments need to strengthen food safety measures. An integrated agroecosystem and human health approach can increase food security and nutrition. The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) provides information on how agricultural knowledge, science and technology can be used to reduce hunger and poverty, improve rural livelihoods and human health, and facilitate equitable environmental and economically sustainable development. The full set of IAASTD reports include a Global and five sub-Global reports and their respective summaries for Decision Makers as well as a Synthesis Report, including an Executive Summary. The reports were accepted at an Inter-governmental Plenary in Johannesburg in April 2008. The assessment was sponsored by the United Nations, the World Bank and the Global Environment Facility (GEF). Five UN agencies were involved: the Food and Agriculture Organization (FAO), the UN Development Program (UNDP), the UN Educational, Scientific and Cultural Organization (UNESCO) and the World Health Organization (WHO). IAASTD Issues in Brief are taken directly from the IAASTD Reports published in 2008 by Island Press.
metals, hormones, antibiotics and various addi- tives in the food system as well as those related to large-scale livestock farming. Strengthened food safety measures are important and necessary in both domestic and export markets, but can improve significant costs. Some countries may need help in meeting food control costs such as monitoring and inspection, and costs associated with market rejec- tion of contaminated or otherwise unsafe commodi- ties and food products.

Occupational Health

Worldwide, agriculture accounts for at least 170,000 occupational deaths each year; in other words, half of all fatal occupational accidents. This is twice the average accident rate for other industries. Machin- ery and equipment, such as tractors and harvesters, account for the highest rates of injury and death, particularly among rural laborers. Other important health hazards include agrichemical poisoning, transmissible animal diseases, toxic or allergenic agents, and noise, vibration and ergonomic haz- ards. The World Health Organization estimates that there are between two and five million cases of pes- dicides poisoning each year affecting pesticide appli- cators and rural communities.

Improving occupational and public health requires a greater emphasis on health protection through development and enforcement of health and safety regulations including international treaties to phase out and ban highly hazardous pesticides. Policies should explicitly address tradeoffs between liveli- hood benefits and environmental, occupational and public health risks, and should promote agricul- tural production systems that simultaneously meet food control costs such as monitoring and inspection, and cost benefits. Some countries may need help in meeting food control costs such as monitoring and inspection, and costs associated with market rejec- tion of contaminated or otherwise unsafe commodi- ties and food products.

Practices and policies for moving to- ward improved health and nutrition

• Use an integrated agroecosystem and human health approach to increase food security and safety, decrease the incidence and prevalence of infectious and chronic diseases, and de- crease occupational exposures, injuries and deaths.

• Invest in robust agricultural, public health, and veterinary detection, surveillance, monitor- ing and response systems to identify the true burden of ill health and cost-effective, health- promoting strategies and measures.

• Promote policies and programs to improve mi- cronutrient intake and diversify diets.

• Increase food safety via effective, coordinat- ed and pro-active national and international food safety systems; legislative frameworks for identification and control of biological and chemical hazards; and farmer-scientist part- nershhips for the identification, monitoring and evaluation of risks.

• Support policies that explicitly recognize the importance of improving human health and nutrition, including regulation of food product formulation and pesticides in foods consumed in drink- ing water; international agreements and regu- lations for food labeling and health claims; and creation of incentives for the production and consumption of healthy foods.

• Strengthen the capacity of agricultural, vet- erinary, and public health systems to reduce the spread of infectious diseases, reduce expo- sure to immune-compromising factors and toxins, and develop and deploy ARST to identify, monitor, prevent, control and treat dis- eases.

• Improve occupational and public health by developing and enforcing health and safety regulations (including pesticide regulations); enforcing cross-border regulations regarding illegal or excessive use of toxic agrichemicals; and conducting health risk assessments and full-cost accounting that make explicit the tradeoffs between maximizing livelihood ben- efits, protecting the environment and improv- ing health.

• On an international level, establish an inde- pendent body dedicated to assessing major recent health issues and providing an early warn- ing and early listening system to help policy makers and stakeholders monitor and assess the devastation of new technologies and their potential socioeconomic, health and environ- mental impacts.

The International Assessment of Ag- ricultural Knowledge, Science and Technology for Development (IAASTD) provides information on how agricultural knowl- edge, science and technology can be used to re- duce hunger and poverty, improve rural livelihoods and human health, and facilitate equitable envi- ronmentally, socially and economically sustainable development. The full set of IAASTD reports in- cludes a Global and five sub-Global reports and their respective summaries for Decision Makers as well as a Synthesis Report, including an Executive Summary. The reports were accepted at an Inter- governmental Plenary in Johannesburg in 2008.

The assessment was sponsored by the United Na- tions, the World Bank and the Global Environment Facility (GEF). Five UN agencies were involved: the Food and Agriculture Organization (FAO), the U.N. Development Program (UNDP), the U.N. Environ- ment Programme (UNEP), the U.N. Educational, Scientific and Cultural Organization (UNESCO) and the World Health Organization (WHO).

IAASTD issues in Brief are taken directly from the IAASTD Reports published in 2008 by Island Press.


The components of health are multiple and their interactions complex. The health of an individual is strongly influenced by genetic make-up, nutritional status, economic conditions, social, cultural, physi- cal, social or workplace — can also play a major role in determining the health of individuals. Agricultural knowledge, science and technology (IAASTD) can play an important role in improving human health and nutrition.

Although current global production of food calories is sufficient to meet demand, the consumption patterns of die or are debilitated every year by hunger and malnutrition, making them vulnerable to infectious diseases, e.g., HIV/AIDS, malaria, tuberculosis, and diarrheal diseases. In many developing coun- tries, hunger and health risks are exacerbated by extreme poverty and poor and dangerous living conditions. About 50% of the burden of malnutri- tion is attributable to unsafe water, unproven sanitation and hygiene practices.

In contrast, in industrialized countries, overnutrition and food safety issues, including bovine illnes- ses affecting human health as well as impacts asso- ciated with agricultural production practices, are predominant concerns. There is also a significant incidence of undernourishment among the poor, and a higher burden of both infectious and non-commu- nicable diseases associated with metabolic syn- dromes, such as diabetes and obesity.

For more information on IAASTD, please see www.assessment.org. To order go to www.islandpress.org/iaastd.