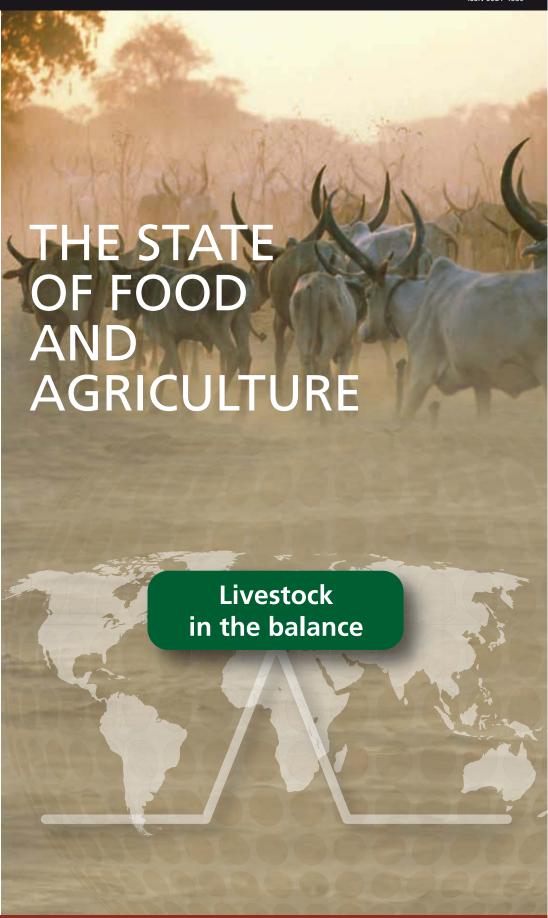
2009





Photos on front cover and page 3: All photos are from the FAO Mediabase. Copies of FAO publications can be requested from: E-mail: publications-sales@fao.org Fax: (+39) 06 57053360 Web site: http://www.fao.org/catalog/inter-e.htm SALES AND MARKETING GROUP

Communication Division

00153 Rome, Italy

Viale delle Terme di Caracalla

Food and Agriculture Organization of the United Nations

THE STATE OF FOOD AND AGRICULTURE

Produced by the
Electronic Publishing Policy and Support Branch
Communication Division
FAO

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views of FAO.

The designations employed and the presentation of material in the map does not imply the expression of any opinion whatsoever on the part of FAO concerning the legal or constitutional status of any country, territory or sea area, or concerning the delimitation of frontiers.

ISBN 978-92-5-106215-9

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to:

Chief
Electronic Publishing Policy and Support Branch
Communication Division
FAO
Viale delle Terme di Caracalla, 00153 Rome, Italy
or by e-mail to:
copyright@fao.org

© FAO 2009

Note:

Unless otherwise stated, data for China refer to China mainland.

Contents

Foreword Acknowledgements Abbreviations and acronyms		vi viii x
PART	·	1
1.	Livestock in the balance	3
	Livestock sector change	5
	Structure of the report and key messages	7
2.	Change in the livestock sector	9
	Consumption trends and drivers	9
	Production trends and drivers	13
	Trade trends and drivers	19
	Outlook for consumption, production and trade	22
	Livestock sector diversity	25
	Transformation of livestock systems	27
	Challenges from continued livestock sector growth	30
_	Key messages of the chapter	31
3.	Livestock, food security and poverty reduction	32
	Livestock and livelihoods	33
	Livestock and food security	38
	Livestock sector transformation and the poor	42
	Livestock and poverty alleviation	43
	Competitiveness and the livestock sector	46
	Livestock policies for sector transition	50
4	Key messages of the chapter	52
4.	Livestock and the environment	53
	Livestock production systems and ecosystems	53 63
	Livestock and climate change Improving natural-resource use by livestock production	66
	Dealing with climate change and livestock	70
	Key messages of the chapter	70 74
_	Livestock and human and animal health	75
٦.	Economic and human-health threats related to livestock disease	7 5 76
	Disease control and risk management	86
	Key messages of the chapter	93
6	Conclusions: balancing society's objectives for livestock	94
٠.	Balancing opportunities against risks	94
	Balancing the needs of different smallholders	94
	Balancing food security and nutrition	95
	Balancing the trade-offs among systems, species, goals and impacts	96
	Balancing objectives in different societies	96
	The way forward: towards an agenda for action for the livestock sector	97
	Key messages of the report	98
PART	II	
Worl	d food and agriculture in review	101
Tre	ends in global food security	104
	ricultural price developments – high variability of basic food prices	105
_		

	mestic food prices in developing countries dium-term prospects for international agricultural commodity prices ricultural production ricultural trade icy responses to higher food prices and their impact on agricultural markets pact of policy responses on global markets nclusions	107 109 111 113 118 119
	III tical annex	123
	ole A1 Production of livestock products, 1995–2007 ole A2 Production of main categories of meat, 1995–2007 ole A3 Per capita consumption of livestock products, 1995–2005 ole A4 Per capita calorie intake from livestock products, 1995–2005 ole A5 Per capita protein intake from livestock products, 1995–2005 Trade in livestock products, 1995–2006	125 130 135 140 145 150
	erences ecial chapters of <i>The State of Food and Agriculture</i>	157 165
T/	ES S	
	Per capita consumption of livestock products by region, country group and country, 1980 and 2005 Urbanization: levels and growth rates Production of livestock products by region, 1980 and 2007 Production of main categories of meat by region, 1987 and 2007 Global trade in livestock products, 1980 and 2006 Meat consumption by region, 2000 and 2050 (projected) Global livestock population and production, by production system, average 2001–2003 Use of feed concentrate by region, 1980 and 2005 Use of feed concentrate by commodity group, 2005 Number and location of poor livestock keepers by category and agro-ecological zone Percentage of rural households owning livestock, share of income from livestock and number of livestock per household, by country Land use by region and country group, 1961, 1991 and 2007 Major environmental impacts of different production systems Direct and indirect impacts of climate change on livestock production systems Some estimated costs of disease in developed and developing countries Some estimated costs of food-borne illness in developed countries	111 133 155 166 21 244 266 299 30 33 34 555 62 666 78 79
В	S	
	Measuring productivity growth in the livestock sector Technological progress in the poultry industry Coordination in livestock value chains Food versus feed: do livestock reduce availability of food for human consumption? The Dairy Goat Development Project in Ethiopia	18 20 28 39 41
	=, = sac = c · c · c · c · c · c · c · c · c ·	

6.	Sector transition – poultry in China	44
7.	Sector transition – dairy in India and Kenya	46
8.	The livestock sector – why supply-side factors matter	48
9.	Kuroiler™ chickens – linking backyard poultry systems to the private sector	50
	Expansion of biofuels production	54
	Conserving animal genetic resources	58
	Assessing the contribution of livestock to GHG emissions	64
	The European Union – integrating environmental protection requirements	
	into the Common Agricultural Policy	68
14.	Reducing nitrate pollution in Denmark	70
	Tapping the climate change mitigation potential of improved land management	. •
13.	in livestock systems	72
16	Animal health and welfare	80
	Global Rinderpest Eradication Programme (GREP) – elements of a success	88
	One World, One Health	91
	Food emergencies	105
	-	
	Domestic food prices in developing countries remain high	110
۷۱.	A return to high agricultural commodity prices?	112
FIGUR	EC	
FIGUR		
1.	Per capita consumption of major food items in developing countries, 1961–2005	9
2.	Per capita intake of energy derived from livestock products by region, 1961–2005	10
3.	Per capita GDP and meat consumption by country, 2005	12
3. 4	Production of meat, eggs and milk by developing country region, 1961–2007	14
5.	World production of main categories of meat, 1961–2007	16
6.	Sources of growth in livestock production: average annual growth in number	17
-	of animals and in output per animal, 1980–2007	17
7.	Value of livestock products as a share of global agricultural export value,	24
_	1961–2006	21
8.	Net exports of meat and dairy products from developed and developing	
_	countries, 1961–2006	22
9.	Meat consumption and share of net imports in consumption, least-developed	
	countries, 1961–2005	23
	Classification of livestock production systems	25
	Percentage of rural households owning livestock, by expenditure quintile	35
12.	Share of income from livestock activity in rural households, by expenditure	
	quintile	36
13.	Number of livestock held by rural households, by expenditure quintile	37
14.	Percentage of households' total livestock production that is sold, by expenditure	
	quintile	38
15.	Impacts of animal diseases on human well-being	76
16.	Balancing policy objectives	97
17.	FAO estimates of number of undernourished people in 2009, by region	104
18.	Indices of agricultural prices	106
19.	Consumer food price inflation 2007–2009, selected countries	108
	Real cereal prices	109
	Growth in agricultural production, by region	114
	Long-term trends in agricultural production, by region	115
	Changes in global real food commodity exports	115
	Changes in real food commodity net trade, by region	116
	Estimated impact of production, consumption, stock and border measures	
	on rice and wheat markets	120
		-



Foreword

This year's report of *The State of Food and Agriculture* is being published at a crucial point in time. The world is going through a financial turbulence that has led to a serious economic setback. But this must not mask the global food crisis that has shaken the international agricultural economy and proven the fragility of the global agricultural system.

Unfortunately, today increasing hunger is a global phenomenon and no part of the world is immune. Our estimates show that the number of those suffering from chronic hunger in the world has topped one billion in 2009 – one billion and 20 million to be more precise. The challenge that lies ahead is to secure the food security of these one billion hungry people and also to double food production in order to feed a population projected to reach 9.2 billion by 2050.

At the global level, recognition has been growing that agricultural development is crucial if we are to reverse this trend and start making significant and sustainable progress towards lifting millions of people out of poverty and food insecurity. This recognition is increasingly finding expression at the highest political levels.

However, the global food and agriculture sector is facing several challenges, including demographic and dietary changes, climate change, bioenergy development and natural-resource constraints. These and related forces are also driving structural changes in the livestock sector, which has developed as one of the most dynamic parts of the agricultural economy.

The global livestock sector has been undergoing change at an unprecedented pace over the past few decades, a process that has been termed the "livestock revolution". Booming demand in the world's most rapidly growing economies for food derived from animals has led to large increases in livestock production, supported by major technological innovations and structural changes in the sector. This surging demand has been mostly met by commercial

livestock production and associated food chains. At the same time, millions of rural people still keep livestock in traditional production systems, where they support livelihoods and household food security.

The rapid transition of the livestock sector has been taking place in an institutional void. The speed of change has often significantly outpaced the capacity of governments and societies to provide the necessary policy and regulatory framework to ensure an appropriate balance between the provision of private and public goods. A number of issues are confronting the sector:

- There is increasing pressure on ecosystems and natural resources - land, water and biodiversity. The livestock sector is only one of many sectors and human activities contributing to the pressure. In some cases its impact on ecosystems is out of proportion with the economic significance of the sector. At the same time, the sector is increasingly facing natural-resource constraints and growing competition with other sectors for a number of resources. Awareness is also increasing of the interactions between livestock and climate change, with the livestock sector both contributing to it and suffering from its impacts. Conversely, it is also being recognized that the sector can play a key role in mitigating climate change through adoption of improved technologies.
- The globalization of food systems has meant an increasing flow of technology, capital, people and goods, including live animals and products of animal origin, around the world. Increased trade flows, along with the growing concentration of animals, often in proximity to large human populations, have contributed to increased risks of spreading of animal diseases and to a rise in animal-related human health risks globally. At the same time, inadequate access to veterinary services jeopardizes the livelihoods

- and development prospects of many poor livestock holders throughout the developing world.
- A final critical issue relates to the social implications of the structural changes in the sector and the role of poor people in the process. How can the livestock sector contribute more effectively to alleviating poverty and ensuring food security for all? Has the rapid development of the sector in many countries benefited smallholders, or are they being increasingly marginalized? If so, is this inevitable, or can the poor be brought into the process of livestock development?

Within each of these three areas, the report discusses the most critical challenges and opportunities facing the sector. It highlights systemic risks and failures resulting from a process of growth and transformation that has outpaced the capacity and willingness of governments and societies to control and regulate. It tries to identify issues that require solutions at various levels to allow the livestock sector to meet society's expectations in the future in terms of provision of both private and public

goods. The issue of governance is central. Identifying and defining the appropriate role of government, in its broadest sense, is the cornerstone on which future development of the livestock sector must build.

The challenges posed by the livestock sector cannot be solved by a single string of actions or by individual actors alone. They require integrated efforts by a wide range of stakeholders. Such efforts need to tackle the root causes in areas where the social, environmental and health impacts of the livestock sector and its rapid development are negative. They must also be realistic and equitable. By focusing our attention constructively, we can move towards a more responsible livestock sector, allowing it to meet the multiple, often competing, objectives of society. It is my hope that this report can contribute towards the first important steps in this direction.

Jacques Diouf
FAO DIRECTOR-GENERAL



Acknowledgements

The State of Food and Agriculture 2009 was prepared by a core team led by Terri Raney and comprising Stefano Gerosa, Yasmeen Khwaja and Jakob Skoet, all of the FAO Agricultural Development Economics Division; Henning Steinfeld, Anni McLeod and Carolyn Opio all of the FAO Animal Production and Health Division; and Merritt Cluff of the FAO Trade and Markets Division. Liliana Maldonado and Paola Di Santo provided secretarial and administrative support.

Overall guidance on the preparation of the report was provided by Hafez Ghanem, Assistant Director-General of the Economic and Social Development Department of FAO; as well as Kostas Stamoulis, Director, and Keith Wiebe, Deputy Director, of the FAO Agricultural Development Economics Division. Additional guidance and support for the preparation of Part I of the report was provided by James Butler, Deputy Director-General; Modibo Traoré, Assistant Director-General of the FAO Agriculture and Consumer Protection Department; and Samuel Jutzi, Director of the FAO Animal Production and Health Division.

Part I of the report, *Livestock in the* balance, was co-edited by Terri Raney, Jakob Skoet and Henning Steinfeld. Drafting was also undertaken by Stefano Gerosa and Yasmeen Khwaja, of the FAO **Agricultural Development Economics** Division; Jeroen Dijkman, Pierre Gerber, Nigel Key, Anni McLeod, Carolyn Opio and Henning Steinfeld, all of the FAO Animal Production and Health Division. Additional contributions were provided by Daniela Battaglia, Katinka de Balogh, Joseph Domenech, Irene Hoffmann, Simon Mack and Jan Slingenbergh, all of the FAO Animal Production and Health Division; Bernadete Neves, Luca Tasciotti and Alberto Zezza, all of the FAO Agricultural and Development Economics Division; Renata Clarke, Sandra Honour and Ellen Muehlhoff, all of the FAO Nutrition and Consumer Protection Division; Nancy Morgan of the FAO Investment Centre Division; and Patricia Colbert, Eve Crowley

and Ilaria Sisto, all of the FAO Gender, Equity and Rural Employment Division.

Part I of the report drew on two forthcoming volumes entitled Livestock in a Changing Landscape, to be published in late 2009 by Island Press, and prepared with the support of several organizations, including FAO, the International Livestock Research Institute (ILRI), FAO Livestock, Environment and Development Initiative (LEAD), the Scientific Committee on Problems of the Environment (SCOPE), Bern University of Applied Sciences, the Swiss College of Agriculture (SHL), the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), and the Woods Institute for the Environment at Stanford University.

It also drew on research papers prepared under the Pro-Poor Livestock Policy Initiative (PPLPI), funded by the Government of the United Kingdom, and the LEAD, funded by the European Union and the Governments of Denmark, France and Switzerland.

Background papers for Part I of the report were prepared by Klaas Dietze (FAO); Jeroen Dijkman (FAO) and Keith Sones (Keith Sones Associates); Klaus Frohberg (University of Bonn); Jørgen Henriksen (Henriksen Advice, Copenhagen); Brian Perry (University of Oxford) and Keith Sones (Keith Sones Associates); Robert Pym (University of Queensland); Prakash Shetty (University of Southampton); Farzad Taheripour, Thomas W. Hertel and Wallace E. Tyner (Purdue University); Philip Thornton (International Livestock Research Institute) and Pierre Gerber (FAO); and Ray Trewin (Australian National University).

Part I of the report benefited greatly from two external workshops, made possible with financial support from the World Bank. The first workshop, held in November 2008, had participation of the following authors of background papers: Jeroen Dijkman, Pierre Gerber, Jørgen Henriksen, Brian Perry, Robert Pym, Keith Sones and Ray Trewin, in addition to Jimmy Smith (World Bank) and FAO staff from the Agricultural

Development Economics Division, the Animal Production and Health Division and the Nutrition and Consumer Protection Division. The second workshop, held in April 2009, had external participation of: Vinod Ahuja (Indian Institute of Management), Peter Bazeley (Peter Bazeley Development Consulting), Harold Mooney (University of Stanford), Clare Narrod (International Food Policy Research Institute), Oene Oenema (University of Wageningen), Fritz Schneider (Swiss College of Agriculture), Jimmy Smith (World Bank), Steve Staal (International Livestock Research Institute), and Laping Wu (China Agricultural University).

Part II of the report, World food and agriculture in review, was prepared by Jakob Skoet and Merritt Cluff, based on inputs from the Commodity Policy and Projections Team of the FAO Trade and Markets Division, with specific contributions from Merritt Cluff, Cheng Fang, Holger Matthey, Grégoire Tallard and Koji Yanagishima.

Part III of the report, *Statistical annex***,** was prepared by Stefano Gerosa.

The expert contributions of the editors, designers, layout artists and reproduction specialists of the FAO Electronic Publishing and Support Branch are also gratefully acknowledged.

Abbreviations and acronyms

BSE bovine spongiform encephalopathy

CBPP contagious bovine pleuropneumonia

CIS Commonwealth of Independent States

CSF classical swine fever

EU European Union

FMD foot-and-mouth disease

GDP gross domestic product

GHG greenhouse gas

GIEWS Global Information and Early Warning System

HPAI highly pathogenic avian influenza

IFPRI International Food Policy Research Institute

IMF International Monetary Fund

IPCC Intergovernmental Panel on Climate Change

ISFP Initiative on Soaring Food Prices

LDC least-developed country

OECD Organisation for Economic Co-operation and Development

OIE World Organisation for Animal Health

PPR peste des petits ruminants

RIGA Rural Income Generating Activities

WHO World Health Organization