Note: Italic page numbers refer to figures & tables. Numbers in brackets preceded by n are note numbers.

```
access issues 36
                                                  away-from-home 92-3, 96, 97,
agricultural extension 15
                                                    139
agricultural machinery 15
                                                  in communities outside China
  see also technological innovation
                                                    102-3, 107(n2)
                                                  estimating 87-8, 90-101, 94, 104
agricultural research 40
                                                  household survey 92-4
agricultural trade 197-214
  arrangements 197-8
                                                  and income 135-6, 138, 170
Agriculture, Ministry of 44, 92, 113,
                                                  parts of animals consumed 97,
    125, 131
                                                    98
agrochemical industry 23(n3), 37
                                                  and production 90-1, 99, 100
  see also fertilisers
                                                  quantity/composition of 92-9
                                                  trends in 45, 46-7, 62, 68, 79,
AIDS (almost ideal demand system)
                                                    200
    42, 74, 77
alcohol industry 29, 120(n2), 157,
                                                    future 101-4, 200
    203, 223
                                                    three stages of 88-90
Andrews, N. 73, 74, 130, 132
                                                  urban/rural compared 93, 94, 96,
Anhui province 30, 33, 35, 35, 36,
                                                    138
                                                data on 88
    37, 82
  feedgrain demand/supply/trade
                                                demand elasticities for 58-9, 60-1
                                                and feedgrain demand 87, 104-5,
    flows in 157, 161, 162, 168,
                                                  122-3, 127, 208, 211, 213-14,
    177-95
  production in
                                                  216
    corn 112
                                                income elasticities for 130-1, 132
    deficit/surplus 149, 168
                                                production 135
                                                  future trends 102, 212
    and population 159
    pork 137
                                                  global increase in 4-5
  rural consumption in 84
                                                tariffs 207, 207
  urban consumption in 70
                                                trade, world 7, 135, 171, 172, 173,
animal husbandry 30, 114-15, 122,
                                                  186, 191, 199, 208-9
                                                  future 208-9, 210-11
    130
  non-grain food sources in 122,
                                                see also individual animal
                                                 products
    123-4, 137
  technological innovation in 167,
                                              aquatic products
    170, 172, 183, 189
                                                as animal feed 175(n1)
                                                consumption 85, 89, 98, 99, 105,
animal products
  consumption 4, 6, 18, 30, 43, 52-3,
                                                  107(n2), 218, 220-1
    55, 87-107, 203
                                                  rural 83-4
```

	urban 66-7, 68, 69, 70-1, 72	cashcrops 11-12, 36, 113, 124
	urban/rural compared 81, 93, 95,	cattle exports 164
	97	Central China 32-3, 33, 34, 38
	conversion ratio 131, 221, 222	Cereal, Oil & Foodstuffs Importing
	income elasticity for 130, 132	& Exporting Corporation 16
	production 87-8, 124, 139	cereals 27, 108, 128, 203
	trade in 199, 200, 207	consumption 82-3
	future surplus of 204, 206, 210-	global 4-5
	11	defined 27
	arable land 40, 120(n2), 134	minor crops 29, 161
	ASEAN 209	production 26, 89-90, 2312
	Asia 8, 225	composition of output 29, 30
	Aubert, C. 87, 125, 125, 134	costs 38, 39
	Australia 154, 155, 157, 164, 202,	decline in 27-8, 28
	212, 225, 233, 237	distribution of 35, 35, 37
		future 208
1	backyard-raising practices 114, 115,	yield 28, 29
	123, 125, 130, 134, 137, 201,	trade, world 199, 200, 211, 212
	211	tariffs for 205
1	barley 108, 109, 157, 161	see also feedgrain and see
	beans 27, 82-3, 223	individual cereals
	beef/mutton 164, 209	Cheng, G.Q. 124, 125-6, 125, 126,
	consumption 105, 218, 221	127, 128, 129, 131
	future trends 104, 127	Chern, W.S. 73, 74, 75, 76, 76, 77-8
	conversion ration for 131, 221	China
	income elasticity for 132	economic growth in 8, 44, 78, 124,
	not traditional meat 98	203, 205, 209, 225-6
	production 124, 134, 135	food policies 17-19, 123, 135
	Beijing city 18, 38	grain policies 11-23, 133, 153-4,
	food consumption/expenditure in	197-8, 234
	69, 70, 79, 82, 83, 92, 115	grain import projections 6
	grain production in 32-3, 35, 36,	simulation results 7
	37	grain output of 24, 26-7, 26, 28,
	corn 112, 157	28, 32-3, 41, 153-4
	and population 159	grain reserve policies 19-20
	Bouis, H. 88	grain-growing regions in 4, 15, 25
	brewery industry 29, 120(n2), 157	north/south distribution/variation
	Britain 155	30-1, <i>31</i> , 36, 80, 108-9, 147,
	buffer reserves 19	150, 157-8
	Burma 155	production/procurement/trade
		policies 11-17, 21, 26, 196-
	CAAS (Chinese Academy of	214, 231-4
-	THE RESERVE OF THE PROPERTY OF	,
	Agricultural Services) 122, 127,	quotas 13, 15, 36
•		
	Agricultural Services) 122, 127,	quotas 13, 15, 36

see also individual	regional imbalances in 115-16
regions/provinces	storage/stocks of 116, 118
China Agricultural Development	tariffs 207, 207
Bank (CADB) 14	trade balance 149-50, 225
China Grain Market Project 20	transportation of 148, 150
China Health & Nutrition Survey	world market 16, 118
434	yellow 15
Chinese Academy of Agricultural	Côte d'Ivoire 153
Services see CAAS	Cox, R. 127
Chongqing city 30, 33, 35, 37, 83,	Crook, F.W. 118
84	cropping
deficit/surplus in 116, 149	as family business 44
production/population in 159	see also harvest; multiple cropping
rural consumption in 84	Cuba 155-6
urban consumption in 70	cultural factors in food demand 102
Chu, Y.T. 44	Cultural Revolution (1966-76) 89
Colby, W.H. 87, 118, 134	For any one Warren
construction industry 44	dairy cattle 40
consumer preferences 138, 139	dairy products 4, 43-4, 50, 66-7, 68,
consumption patterns 3-4, 6, 42-4,	<i>85</i> , <i>203</i> , 211
216-18, <i>220-1</i> , 229-30	balance of trade 204, 206, 208
conversion ratios 130, 131, 137,	rural 83-4
221-2	urban 66-7, 72
corn 13, 15, 27, 109-20, 147	urban/rural compared 93, 93, 96,
consumption 82-3, 115-16	97, 138
dense-leaf 113	see also milk
as feedgrain 30, 108, 161, 231	data issues 20, 43-4, 64(n1), 73, 76-
imports/exports 118, 153, 153,	7, 78, 87-8, 133-4, 174, 235
156, <i>156</i> , 161, <i>200</i> , 233	Davis, J. 73, 74
prices 111, 116, 117, 118-19	DDGS (distillers dried grains with
production 28, 28, 109-13, 115,	solubles) 115
223	demand systems approach 73, 77,
costs 38, 39, 111, 112, 117	130-2
as feedgrain 30, 108	demand/supply approaches 121-44
inefficient 117-18	demographics see population
land conversion for 118, 231	diet 42, 90, 148, 217
regional distribution 33, 34, 35,	and health 47, 97
35, 36, 37, 116, 118	direct payments 15
Corn Belt 110-11, 111	Doha Round 4, 238
technological innovation in 113,	Dominic, S. 164
133	drought 111
total output 29-30, 30, 109, 110,	
111	econometric modelling 50, 76, 78,
yields 28-9, 29, 112, 113, 117-	79, 127
18, 133, 169-70	

economic growth/development 8, 44,	feed-meat conversion ratios 125,
124, 203, 205, 209, 225-6	127, 128, 129, 130, 133, 136,
education 50, 56, 57, 59, 62, 237	137-8, 139-40
eggs 104, 132	calculation of 134-5, 221
consumption 85, 90, 93, 101, 105,	feedgrain 108-20
107(n2), 217, 221	consumption 6-7, 30, 113-15, 114,
conversion ratio for 131, 221,	118-19, <i>154</i> , <i>220</i> , 221, 230-1
222	regional patterns 161, 162
rural 83-4, 221	data issues 113, 115, 124-6, 127,
urban 66-7, 68, 70-1, 72, 220	129, 133-4
urban/rural compared 81, 87, 95,	defined 108, 161
96, 124	demand/supply/trade flows 5-6,
production 99, 100, 102, 134, 135	18, 158, 160-95, <i>177-95</i> , 232
ELES (Extended Linear Expenditure	assessment of 219-23
System) model 77	base scenarios 166-7, 168, 177-80
Engel functions 43, 65, 65, 79, 80	changes in 169-72
Enke, Stephen 162	data issues 161, 174, 221
environment	future trends 7, 104-5, 117-19,
degradation of 14, 37, 237	121-44, 172, 173, 208-9, 211,
protection of 21, 39, 135, 234	212, 221, 226, 233
rehabilitation of 27	conceptual considerations
Europe 164, 209, 212-13, 223, 225	121-4
European Union (EU) 200, 202, 211	determinants of 123, 135-8
export licences 16	limitations of scenarios 174
export subsidies 16, 204	research priorities 138-40
Extended Linear Expenditure	various projections 127-35,
System (ELES) model 77	167-74, 178-96, 213-14
	growth in 216-18, 238
family networks 23(n6)	past experience 124-6
Fan, S.G. 42, 43	regional factors 6, 7, 115, 137
Fan, Y.L. 105, 130, 131, 132, 222	simulation scenarios 167-9, 169,
FAO (Food & Agriculture	177-95
Organization of the UN) 4-5,	theoretical models of 162-6
236	trade balance 124, 161-2, 162
farmers/farms 11-12, 234	trade restrictions 167, 187, 192
animal 44	and urbanisation 217-18
in contracts 39-40	and foodgrain 6, 7-8, 21, 40, 85,
direct payments to 15	122, 123, 196, 223, 224-5
education 237	industrial feed from 114-15, 115
incentives for 27, 36	price 170, 171, 201
income see rural under incomes	production 6-7, 30, 108-13, 136,
intensive 68	161, 162
small-scale 24, 25, 40	elasticities of 169-72
see also backyard-raising	technological innovation in 167,
support for 19, 236	169-70, 171-2, 173-4, <i>181-2</i> ,
	188

transporting 116	studies summarised 74-9, 74-5
world market 4, 21, 117, 200, 201 yields 117	urban/rural compared 79-81, 80, 223, 224
Feedgrain Spatial Equilibrium	and feedgrain 6, 7-8, 21, 40, 85,
Model (FSEM) 164-6	122, 123, 196, 223, 224-5
fertilisers 12, 23(n2), 37	rationing see rationing
Findlay, C. 118, 128, 129	see also specific foodgrains
fish see aquatic products	forests/forestry 27, 203
fishing industry 44	France 117, 157
floor prices 14	free trade/market 7, 18, 21, 169, 171
flour 154, 203	fruit 52-3, 60-1, 66-7, 85, 138, 201,
food availability/shortages 62, 88-9	203
food consumption 42-51, 89, 92	rural consumption 83-4
away-from-home 66-7, 68, 79,	urban consumption 66-7, 68, 70-2
92-3, 96, 139	Fujian province 33, 35, 37, 82
data quality for 43-4, 51	feedgrain in 115, 116, 118
effect of income on 42-3, 47, 55 rural	demand/supply/trade flows 162, 168, 177-95
expenditure on 45, 46, 48-9, 50,	production deficit/surplus in 149,
54, 62	149, 159, 162, 168
elasticities 58-9, 60-1, 77-8	rural consumption in 84
staple 45, 46, 47, 50, 54, 79	urban consumption in 69, 70
see also foodgrain	Fuller, F. 87, 134
urban	
changes in 65-8, 66-7	Gansu province 14, 33, 35, 37, 83,
expenditure on 69, 70-1, 76	84, 92
urban/rural compared 80-1, 81	feedgrain in 162, 168, 177-95
food security 3, 11, 18, 87, 122,	production deficit/surplus in 150,
152-3, 197	159, 162, 168
grain security 20, 21	corn 112
foodgrain 4	urban consumption in 71
consumption 45, 46-7, 62, 90, 154,	Gao, R. 131
223-6, 229-30	Gao, X.M. 78
rural 42-64, 82-3	Garnaut, R. 102, 118, 125-6, 126,
analytical model 51, 57-9	128, 129, 131, 131
household survey 44-64, 52-	GMO issues 238
61	Goletti, F. 164
literature review 42-4	Gould, B.W. 42-3, 74, 76
urban 65-86 data issues 76-7	government shops 18, 21, 23(n5)
describing 65-8	grain coarse 108, 109, 113, 161, 230
expenditure on 70-1	future surplus of 204, 206
elasticities 73, 74-5, 77-8	see also com; feedgrain
and income level 72, 74-5	defined 27
modelling 73-9	fine 108

growth periods 36-7	projections 6-7, 17
growth periods for 36-7	sources/destinations of 154-7,
production/consumption pattern	155, 156, 157
147-8, 231-2	international contracts in 237
total demand/supply for 87, 122,	prices see grain price
133, 229	reforms 158
projected 121, 209	tariffs see tariffs
grain consumption 157-8, 214, 218,	trade arrangements 197-8
224	grain price 3, 15, 27, 153, 235, 236
decline in 6, 18, 21, 30	linkage 16
future 196-215	regional differences 69
increase in 154, 154	set by central government 12-13,
on-farm 21, 25	14, 16, 18
policies 17-19	grain procurement 11-12
grain coupons 17, 18	price increases in 12-13, 17
grain distribution see transportation	unified scheme 17-18
"Grain for Green" program 14-15,	grain production
27, 39	characteristics of 24-6
grain market 21, 140, 145-226, 212,	government policy 26, 27, 36,
225	41, 237
and crop adjustment 36	adjustment incentives 36
data issues 147, 148, 151	regional variations 25-6
domestic 7, 147-51, 157, 232	small scale 24-5, 40
minimum price scheme 12, 14	and crop composition 26-30
price increases 12-13, 15, 17, 18	patterns/trends 6-7, 24-41, 26
reforms/liberalisation 14-16,	fluctuations 26-7
148, 158	policies 11-17
regional demand/supply/trade	reduced output 16
flows, see also under feedgrain	regional distribution of 30-6, 31,
regional trade balance 147-51,	32-3, 35, 223, 231-2
149-50, 151, 152	sustainability issues 37
integration 40	technologies/costs 36-8, 39, 40
protection 236	and water quality/quantity 38-9
stability of 234-5	see also under specific grains
world 4, 8, 13, 40-1, 233, 236-9	grain quality see quality issues
foodgrain/feedgrain demand in	grain reserve see grain storage
5, 196	grain risk funds 15, 19
future projections 196-215, 233	grain sale price 17-18
data/parameters 204-7	grain security 20, 21
policy analysis models 202-7	grain shortage 11, 15, 17
import/export 3, 7, 13, 152-7,	grain storage/stocks 11, 12, 15, 16,
<i>153</i> , 158	27, 116, 122
composition/level of 152-4	lack of facilities for 19
government control of 14, 16,	policies 19-20
18	reduction of 16-17
non-market factors in 17	reserve data 20, 153, 235

grain surplus 3, 12	Guo, Q.F. 127, 128
grain varieties 3-4, 15, 36, 157, 232	Guo, X.G. 42, 43
grazing systems 4, 14, 27	-,,
Great Leap Forward 87	Hainan province 30, 33, 35, 37, 82
GTAP model 202, 204-7, 206, 208-	feedgrain demand/supply/trade
9, 211, 213	flows in 162, 168, 177-95
Guangdong province 30, 33, 35, 36,	production in
37, 82	corn 110, 111
consumption in	deficit/surplus 149, 149, 162, 168
animal products 92	and population 159
rural 84	rural consumption in 84
urban 70, 79	urban consumption in 69, 70
corn imports/exports 150, 156, 157	Haines, P.S. 42
corn prices in 116, 117	Halbrendt, C. 42, 43, 164
feedgrain in 108, 115, 116, 118,	harvests 11, 12, 16, 122, 223, 236
137	multiple cropping 25
demand/supply/trade flows 161,	and reserve policies 19
162, 168, 177-95	hay production 40, 232
household survey 43, 44-61	Hayes, D.J. 42
production in	Hearn, D. 164
deficit/surplus 149, 149, 162,	Hebei province 33, 34, 35, 35, 36,
168	37, 38, 82, 83
and population 159	deficit/surplus in 149, 161, 162
pork 116	demand/supply/trade flows in 150,
region described 45	162, 168, 177-95
Guangxi province 33, 35, 36, 37, 82	feedgrain consumption in 115,
feedgrain in 108, 116, 118	161, <i>162</i>
demand/supply/trade flows 162,	household survey 43
168, 177-95	production in
production in	corn 110, 111, 112
corn 110, 111, 111, 112, 117	for export 157
deficit/surplus 149, 162, 168	and population 159
and population 159	pork 116
rural consumption in 84	urban consumption in 70
urban consumption in 70	Heilongjiang province 82, 83
Guizhou province 33, 35, 36, 37, 92	demand/supply/trade flows in 149,
feedgrain demand/supply/trade	149, 162, 168, 177-95
flows in 162, 168, 177-95	feedgrain consumption in 115, 162
production in	production in 15, 33, 34, 35-6, 35,
corn 111, 112, 117	37
deficit/surplus 150, 161, 162,	corn 110, 111, 111, 112, 115
168	for export 156, 157 feedgrain 161, 162, 168
and population 159 rural consumption in 83, 84	and population 159
•	urban consumption in 70
urban consumption in 69, 71	urvan consumption in 70

Henan province 82, 84	production in
deficit/surplus in 149, 157, 162,	for export 156
168	feedgrain 168
feedgrain in 115	and population 159
demand/supply/trade flows 161,	pork 116, 137
162, 168, 177-95	rural consumption in 84
production in 15, 33, 34, 35, 35,	urban consumption in 70
36, 37, 38	Huo, Q.G. 131
corn 110, 111, 112	
and population 159	incomes
pork 137	and data accuracy 78
rural consumption in 84	elasticities 73, 74-5, 102, 103-4,
urban consumption in 69, 70	105, 127, 130-1, 132, 139, 222
Hertel, T. 202	estimations of 130
hoarding 12	in future projections 205, 206
Hong Kong 102-3, 156, 156, 171,	impact on food demand 42-4, 47,
202	59, 62, 72, 78, 85, 85, 96, 201,
household surveys 42-86	217
data issues 76-7	impact on grain demand 6, 18, 65,
Huang, J.K. 42, 43, 73, 74, 76, 76,	72, 80-1, 108, 135-6
88, 105, 127-8, 128, 131, 132,	feedgrain 170, 172, 173, 184-5,
215(n3)	216, 222
Huang, K.S. 105	off-farm 38, 50, 51, 56, 57-8, 59,
Huang-Huai-Hai Plain 110	62
Hubei province 82	rural 13-14, 16, 21, 56, 217, 222,
deficit/surplus in 149, 162, 168	234, 238
feedgrain in 108, 115, 116, 118	and living expenditure 47, 48-9
demand/supply/trade flows 161,	urban 72, 74-5, 222
162, 177-95	urban/rural compared 80
household survey in 44-61	indica rice 15, 28, 38, 39, 108, 150
production in 30, 33, 35, 35, 36,	Indonesia 155, 155, 156, 202
37	industrial animal feed 114-15, 115
corn 112, 117	industrial use of grains 5
feedgrain 161, 162, 168	inflation 13, 68
and population 159	infrastructure 12, 16, 34, 37, 40, 116,
pork 116	118, 157
region described 45	Inner Mongolia see Mongolia, Inner
rural consumption in 84	input price levels 12, 23(n3)
urban consumption in 70	intensive farming 68
Hunan province 33, 35, 35, 36, 37,	see also multiple cropping
82	intercropping 36
deficit/surplus in 149, 162, 168	irrigation 37, 136
feedgrain in 108, 115-16, 117, 118	
demand/supply/trade flows 161,	Japan 155, 156, 156, 171, 200, 201,
162, 177-95	202, 209, 211, 212-13, <i>225</i>
imports to 150	japonica rice 15, 34, 38, 39, 150, 232

Jia, Y.L. 88, 134	labour productivity/costs 24, 37-8,
Jiangsu province 82, 83	39, 200
consumption in	labour-day inputs 38
animal products 92	land
rural 84	arable 40
urban 70	degradation 237
deficit/surplus 149, 161, 162, 168	deviated use of 36
feedgrain in 108, 115, 116, 118	fragmentation 40
demand/supply/trade flows 161,	for non-agricultural use 27, 40
162, 168, 177-95	overuse 25
production in 15, 30, 33, 35, 35,	productivity 24
36, <i>37</i> , 38	reclamation/conversion 13, 118
corn 112	to non-agricultural use 15
for export 156	Latin America 155, 212, 237
feedgrain 168	Lewis, P. 73, 74, 130, 132
and population 159	Li, E. 42, 43
pork 116, 137	Li, Y.Z. 222
Jianxi province 33, 35, 35, 37, 38,	Liaoning province 33, 35, 35, 37, 82,
82, 150	83
feedgrain in 108, 162, 177-95	consumption in 70
production in	feedgrain 115, 161, 162
corn 110, 111	deficit/surplus in 148-9, 149, 162,
feedgrain 161, 162	168
and population 159	demand/supply/trade flows in 157,
pork 116	177-95
Jilin province 33, 35, 35, 36, 37, 82,	production in
83	corn 110, 111, 111, 112, 115
consumption in	feedgrain 161, 162, 168
animal product 92	and population 159
feedgrain 115, 161, 162	pork 116, 137
urban 70	liberalisation 14-16, 26, 148, 158
corn prices in 116, 117	Liu, J. 122, 127, 128
deficit/surplus in 149, 149, 162,	Liu, K.E. 74, 75, 76, 76, 77-8
168	Liu, S.B. 130, 131
demand/supply/trade flows in 177-	livestock products see animal
95	products
production in	living expenditure, changes in 47,
corn 110, 111, 111, 112, 115	48-9, 79
for export 156, 157	Lu, F. 87, 134
feedgrain 161, 162, 168	Lu, X.J. 131
Judge, G.G. 162, 164	
	Ma, G. 102, 118, 125-6, 126, 128,
Koo, W.W. 163-4	129, 131, <i>131</i>
Korea see North Korea; South Korea	Ma, J. 75, 76
	Macao 171

MacAulay, T.G. 163, 164	production in
Malaysia 155, 156, 202	corn 110, 111, 112, 115
market forces 21, 30, 40	for export 156, 157
Martin, L.J. 163	feedgrain 161, 162, 168
meat	and population 159
consumption 43, 44, 47, 52-3, 55,	Mu, Y.Y. 74
60-1, 62, 85, 89, 93-4, 105, 217,	Mullen, J. 159(n2)
218	multiple cropping 25-6
in communities outside China	technology for 36-7
102-3	mutton/lamb see beef/mutton
historical overview 88-90, 124	
lean/fatty 97, 98, 138	national security 19, 20
processed 97-8	natural resources see environment
rural 83-4, 87, 217	net social revenue (NSR) model 163,
urban 66-7, 68, 70-1, 72, 87, 220	164
urban/rural compared 81, 87, 93,	net social welfare (NSW) model 163
95	Ningxia province 33, 35, 37
consumption/production 90-1, 91,	feedgrain in 162, 168, 177-95
99, 100	production in
conversion ratios for 222	corn 112
future surplus/deficit of 204, 206	deficit/surplus 150, 162, 168
income elasticities for 130-1, 132,	and population 159
136	rural consumption in 83, 84
production 87-8, 102, 134, 135	urban consumption in 71
trade, world 200, 214	non-agricultural employment 38, 56,
see also animal products; beef;	59, 62, 238
pork; poultry	non-tariff barriers (NTBs) 198
milk 203	North Korea 155, 156, 171, 200,
consumption 50, 52-3, 55, 60-1,	201, 202
62, 72, 89, 105, 107(n2)	•
future trends 102, 104	oats 108, 161
conversion ratio for 131	OECD countries 197
income elasticity for 132, 136	off-farm employment 50, 51
production 99, 100, 124, 134, 135	oilseeds 36, 199, 200, 203
millet 27, 108, 147, 161	on-farm consumption 21, 25
minimum price policy 12, 14	•
Minot, N. 164	paddy see rice
mixed crop-livestock production 4	panic buying 18, 153
modelling techniques 130	pastures see grazing
Mongolia, Inner 33, 35, 35, 37, 82,	pesticides 37
83	Philippines 155, 155, 202
consumption in 70, 92	Pinstrum-Anderson, P. 105, 132
deficit/surplus in 149, 149, 167,	population 8, 159
168, 171	growth 89, 222
feedgrain demand/supply/trade	movement 148
flows in 177-95	see also urbanisation

pork	regional production policies 13, 15,
consumption 90, 93, 94, 94, 95,	25-6
<i>98</i> , <i>101</i> , <i>105</i> , 217-18, <i>220-1</i>	regional trade flows 160-95
away-from-home 97	research & development (R&D) 170,
future trends 102, 103	172, 181-2, 237
preparation for 98	see also technological innovation
conversion ratio for 130, 131, 137,	Research Centre for Rural Economy
221, 222	(RCRE) 44
income elasticity for 130, 132	reserve stocks see grain
production 34, 114, 116, 122, 123,	storage/stocks
134, <i>135</i>	restaurants 68, 139
potatoes 27	RGCFDS (Research Group for
poultry	China's Food Development
consumption 105, 217, 220-1, 221	Strategies) 105, 126, 126, 127,
future trends 103	128, 131, 132
urban/rural compared 94, 94, 97	RGCFMR (Research Group for
conversion ratio for 131, 222	China's Feedgrain Marketing
exports 200	Reforms) 127, 128
income elasticity for 132	rice 13, 27, 147, 203
production 102, 124, 135	consumption 43, 80, 81, 82-3, 157,
poverty 21, 23(n6), 47, 50, 59,	230
64(n3)	early-crop 108
private sector 118-19	as feedgrain 108, 109, 118,
processed food 68, 91, 97-9, 98	120(n3), 231
profit motive 16, 20	imports/exports 34, 153, 153, 155-
pulses 27	6, 200, 233
· ·	indica 15, 28, 38, 39, 108, 150
Qinghai province 33, 35, 37, 83, 84	japonica 15, 34, 38, 39, 150, 232
deficit/surplus in 150, 162, 168	milling rate 81
feedgrain in 162, 168, 177-95	production 28
production/population in 159	costs 38, 39
rural consumption in 83, 84	regional patterns 25-6, 32, 33-4,
urban consumption in 69, 71	35-6, 35, 37
quality issues 15, 25, 27, 28, 30, 39-	in share of total output 29-30, 30
40, 108-9, 232, 238	yields 28, 29, 108
quotas 12-13, 199	trade balance 149-50, 225
	future projections 204, 206, 208,
railways 16	212
rationing 17, 23(n5), 76, 78, 147-8	transportation of 147-8, 150
regional consumption patterns 51,	Rozelle, S. 42, 43, 105, 127-8, 128,
70, 78, 230	131, 132
regional demand/supply 6, 7	rural households
regional distribution 18	consumption patterns 42-64, 52-
see also under com	61, 139
regional price differences 69	living expenditure 47, 48-9
The second secon	A DESCRIPTION OF THE PROPERTY

	occupations 44	Shanxi province 33, 34, 35, 82, 83
rui	ral/urban consumption 6, 30, 62	deficit/surplus in 149
Ru	issia 155, 156, 156, 171, 202	feedgrain demand/supply/trade
	therford, A. 164	flows in 162, 168, 177-95
		production in
Sa	bates, R. 74, 76	corn 112
	kong, Y. 42	for export 157
	muelson, P.A. 162-3	and population 159
	nitary & phytosanitary measures	pork 137
5	see SPS	urban consumption 69, 70
see	eds 15, 236	Shi, H.Q. 73, 74
	GMEs see state grain marketing	Shono, C. 43, 136
5.	enterprises	Sichuan province 83, 84
Sh	naanxi province 14, 33, 35, 37, 83,	animal product consumption in 92
Di	84, 92	corn prices in 116, 117
	consumption in	feedgrain in 108, 115, 116, 118
	feedgrain 115, 162, 168, 177-95	demand/supply/trade flows 161,
	urban 71, 79	162, 168, 177-95
	production in	imports to 150
1	corn 112	production in 14, 30, 33, 35, 35,
	deficit/surplus 150, 162, 168	36, 37
	and population 159	corn 110, 111, 112, 117
C1.	pork 137	deficit/surplus 150, 168
	nandong province	and population 159
	animal product consumption in 92	pork 116, 137
	corn prices in 116, 117	urban consumption in 70
	feedgrain in 115, 161, 162, 168,	silage 40
£	177-95	Singapore 102-3, 202
	imports to 150	single equation approach 73, 74
1	production in 15, 33, 34, 35, 35,	soil degradation/erosion 25, 37
	37, 82	sorghum 27, 108, 147, 161
	corn 110, 111, 112	South Korea 155, 156, 156, 200,
	demand/supply 168, 177-80	201, 209, 211, 212-13, 225
	and population 159	Soviet Union 19
	pork 116	see also Russia
	rural consumption in 84	sown areas 11-12, 231
	urban consumption in 70	soybean 13, 15, 27, 82-3
Sh	nanghai city 18, 33, 35, 36, 37, 38,	imports 16
	226	spatial equilibrium models (SEM)
	corn imports to 157	162-6, 173
	deficit/surplus in 149, 162, 168	spring wheat 15, 28, 34
	feedgrain demand/supply/trade	SPS (sanitary & phytosanitary)
	flows in 177-95	measures 196, 200, 203, 211-12
	production/population in 159	SSB see State Statistical Bureau
	urban consumption in 69, 70, 82,	State Grain Bureau 20
	<i>83</i> , 115	

state grain marketing enterprises	impact on supply/demand/trade
(SGMEs) 14, 15, 153	flows 169-70, 173-4, 181-3
State Grain Reserve Bureau 12, 19,	Thailand 155, 155, 202, 225, 233
20	Tian, W.M. 73, 74, 76, 76, 78, 117,
State Grain Reserve Management	169-70
Corporation 20	Tianjin city 32-3, 35, 36, 37, 82, 83
State Planning Commission 38	deficit/surplus in 149
State Statistical Bureau (SSB) 43,	feedgrain demand/supply/trade
44, 73, 77, 139, 148	flows in 162, 168, 177-95
on meat consumption 87, 88, 91,	imports to 150
94, 95, 99, 100, 127	production in 112
state trading enterprises (STEs) 16	and population 159
structural adjustment 40, 213, 234,	urban consumption in 38, 70, 115
238	Tibet 33, 35, 37, 83, 84
subsidies 7, 18, 23(n3), 238	deficit/surplus in 150, 162, 168
for exports 16, 204	feedgrain in 162, 168, 177-95
on grain consumption 17-18	production/population in 159
stopped 16	urban consumption 71
sugar 203, 206	timesaving 36-7
consumption 85	tobacco industry 45, 203
rural 83-4	Tokyo Round 204
urban 66-7, 68, 70-1	trade 140
urban/rural compared 81	free/restricted 7, 167, 169, 171,
as feed product 118	172, 173, 174, 187, 214
sweet potatoes 27	SPS/TBT 196, 200, 203, 211-12
Swiss tariff cut formula 205, 209	future scenarios 203-11
5 7105 WIII CUI 101111111 200 , 200	reforms 5, 135, 137, 197-8, 201,
Taiwan 102-3, 107(n2), 129, 155,	203, 212, 238
198, 202, 205	see also grain market
Takayama, T. 162, 164	transparency 20
Tang, Z.P. 118	transportation of grains 16, 18, 34,
tariff-rate-quota (TRQ) systems 203,	40, 116, 122, 147-8, 150-1, 157,
211, 215( <i>n</i> 1), 233	158
tariffs 196, 198, 199, 203-4, 205,	costs 171
207, 207	tree plantations 14, 27
cuts 205, 209-10	Tuan, F. 42, 43
regional 7	tubers 27, 82-3
tax 13, 44, 50, 58	140013 21, 02-3
agricultural 16, 21	unified grain procurement scheme
refund for exports 16	17-18
TBT (technical barriers of trade)	United Kingdom 155
196, 200, 203, 211-12	United Nations see FAO
technological innovation 7, 12, 36-8,	United States 17, 117, 154, 155, 164,
40, 110, 113, 117, 122, 133,	202, 223, 225, 237
136, 167, 169-70, <i>181-2</i>	urban households
150, 107, 107-70, 101-2	on Own mountain

expenditure 69, 70-1, 76, 77	decline in 28, 28
survey data 43, 44, 73	quality 39-40
urban population 17, 18, 19, 21	regional patterns of 25, 32, 34,
compensated for price increases	35, 35, 36, 37
23(n4)	in share of total output 29-30,
consumption, see under specific	30, 231
foodstuffs/regions	yield 28-9, 29
urbanisation 27, 40, $64(n6)$ , 123,	spring 15, 28, 34
217-18, <i>219</i> , 222, <i>223</i> , 226	tariffs 207, 207
Uruguay Round (UR) 196, 197, 201,	trade balance 149-50, 225
203, 238	future deficit of 204, 206, 208
USDA 118	transportation of 147-8, 150
	white 15
varieties 3-4, 15, 36, 157, 232	winter 34
seeds 15, 236	world market 16
vegetables 36, 52-3, 60-1, 66-7, 68,	winter crops 34, 109
85, 201, 203	wool 204, 206, 207, 208, 208, 209
rural consumption 83-4	World 2015/2030 (FAO) 4-5
urban consumption 66-7, 68, 70-2,	World Bank 20
76	World Trade organisation (WTO)
urban/rural compared 81	14, 118, 137, 158, 160, 171, 236
Vietnam 155, 164, 202	China's commitments to 21, 40,
100,100,202	198, 199, 201, 203, 205, 238
Wailes, E.J. 42	effect of China joining 4, 7, 15,
Wan, G.H. 42, 117, 169-70	16, 174, 202, 207-8, 213-14
Wang, H. 131	negotiations 196, 197, 198, 201
Wang, J.M. 105, 124, 125-6, 125,	Wu, H.X. 222
126, 130, 131, 132, 218, 222	Wu, Y.R. 42, 43, 74, 76, 222
Wang, L.M. 73, 74	
Wang, Q.B. 73, 75	Xian, Z.D. 148
Wang, Z. 73, 78	Xin, X 170
water 38-9, 136, 237	Xinjiang province 33, 35, 36, 37, 83,
use policy 39	84
weather conditions 34, 87, 109, 113,	feedgrain in 162, 168, 177-95
122, 137	production in
Webb, S.E. 164	corn 112
wheat 13, 27, 203	deficit/surplus 150, 162, 168
consumption 43, 80, 81, 82-3, 157,	and population 159
230	rural consumption in 83, 84
as feedgrain 108-9	urban consumption in 71
flour 154, 203	urban consumption in 71
imports/exports 17, 152-3, 153,	Yang, Z.H. 113, 114
	The state of the s
154, 200, 208, 233	yellow corn 15
milling rate 81	yields 11, 28-9, 29, 30, 40, 108, 133,
production 232	232
costs 38, 39	see also individual crops

Yu, J. 131	Zhejiang province 33, 35, 36, 37, 38,
Yuan, X.G. 87-8, 134	82, 83
Yunnan province 33, 35, 36, 37, 83, 84	deficit/surplus in 149, 149, 162, 168
feedgrain in 162, 168, 177-95	feedgrain in 108, 115, 116, 137
household survey in 44-61, 92	demand/supply/trade flows 162,
imports/exports 157	168, 177-95
production in	production in
corn 110, 111, 112, 117, 157	corn 110, 111, 117
deficit/surplus 150, 162, 168	feedgrain 168
and population 159	and population 159
region described 45	urban consumption in 69, 70
rural consumption in 83, 84	Zheng, Z.H. 118
urban consumption in 71, 79	Zhong, F.N. 87, 134
	Zhou, J.L. 43-4, 136
Zeng, Q.L. 131	Zhou, L. 131
Zhang, H. 127, 128	Zhou, Z.Y. 127
Zhang, W. 73, 75	Zhu, X.G. 105, 127, 128, 132