664 OPE

Contents

Contributor contact details	xiii
Woodhead Publishing Series in Food Science, Technology and Nutrition	xix
Foreword by J. Hyman	xvii
Foreword by W. H. Noordman and E. M. Meijer	xiii

Part I The changing nature of innovation in the food and drink industry

1	Tren	ds in the acquisition of external knowledge for innovation in
	the f	ood industry
	М. А	costa, D. Coronado and E. Ferrándiz, University of Cadiz, Spain
	1.1	Introduction
	1.2	Reasons for open innovation in the food industry 4
	1.3	Measuring open innovation in the food industry
	1.4	Sources and types of data
	1.5	Results of the open-innovation study
	1.6	Conclusions
	1.7	Acknowledgements
	1.8	References
	1.9	Appendix: concordance between agri-food technological
		sectors and International Patent Classification (IPC) 23
2	The 1	tension between traditional innovation strategies and
	open	ness: Lindt's controlled open innovation approach
	-	zzarotti and R. Manzini, Cattaneo University – LIUC, Italy
	2.1	Introduction
	2.2	Literature review
	2.3	Research method for Lindt case study
	2.4	Open and closed innovation at Lindt

	2.5	Lindt's open-innovation approach in practice: the innovation	
		project Noccior	32
	2.6	Results of controlled open innovation in the Lindt case	34
	2.7	Conclusions	36
	2.8	References	36
3	The r	ole of open innovation in the industry convergence between	
		and pharmaceuticals	39
	S. Bra	öring, University of Applied Sciences Osnabrück, Germany and	
	Wage	ningen University and Research Centre, The Netherlands	
	3.1		39
	3.2	A brief literature review on industry convergence	40
	3.3	Convergence-related challenges and the role of open	
		innovation	43
	3.4	Evidence for industry convergence between foods and	
		pharmaceuticals	47
	3.5	Open innovation in order to cope with convergence in the	
		neutraceuticals and functional foods (NFF) sector	51
	3.6	Conclusion	56
	3.7	Future trends	58
	3.8	References	59
4	Accel	erating the innovation cycle through intermediation: the case of	F
•		's melt-proof chocolate bars	
		elens, NineSigma, Belgium	
	4.1	Introduction	63
	4.2	From research to search in company innovation	
	4.3	Key capabilities in open innovation	
	4.4	From idea-driven innovation to need-driven innovation	
	4.5	Case study: melt-proof chocolate bars from Kraft	
	4.6	Conclusions	
	4.7	Future trends	
	4.8	References	
	4.0		12
5			
3		mpact of open innovation on innovation performance: the case	
3	of Sp	anish agri-food firms	74
5	of Sp		74
5	of Sp C. Ba	anish agri-food firms	74
5	of Sp C. Ba Unive	anish agri-food firms	74
5	of Sp C. Ba Unive	anish agri-food firms yona-Sáez, T. García-Marco and M. Sanchez-García, ersidad Pública de Navarra, Spain and C. Cruz-Càzares, ersity of Barcelona, Spain	74 74
5	of Spa C. Ba Unive Unive	anish agri-food firms yona-Sáez, T. García-Marco and M. Sanchez-García, ersidad Pública de Navarra, Spain and C. Cruz-Càzares, ersity of Barcelona, Spain Introduction: the agri-food sector and innovation	
5	of Spa C. Ba Unive Unive 5.1	anish agri-food firms yona-Sáez, T. García-Marco and M. Sanchez-García, ersidad Pública de Navarra, Spain and C. Cruz-Càzares, ersity of Barcelona, Spain Introduction: the agri-food sector and innovation How innovative are Spanish agri-food firms?	74
Σ	of Spa C. Ba Unive Unive 5.1 5.2	anish agri-food firms yona-Sáez, T. García-Marco and M. Sanchez-García, ersidad Pública de Navarra, Spain and C. Cruz-Càzares, ersity of Barcelona, Spain Introduction: the agri-food sector and innovation How innovative are Spanish agri-food firms?	74 77
Σ	of Sp C. Ba Unive 5.1 5.2 5.3	anish agri-food firms	74 77 80

Part II Partners and networks for open innovation

6	Partnering with public research centres and private technical and scientific service providers for innovation: the case of Italian rice		
		pany, Riso Scotti	. 97
		uzzarotti and R. Manzini, Cattaneo University – LIUC, Italy	
	6.1	Introduction	. 97
	6.2	The role of private technical and scientific service (TSS)	
		providers: advantages and limitations	. 99
	6.3	The role of universities and public research centres:	
		advantages and limitations	100
	6.4	Riso Scotti case study	
	6.5	Conclusions and managerial implications	
	6.6	References	107
7	Cons	sumers as part of food and beverage industry innovation	109
		Kemp, Consultant, UK	
	7.1	Introduction	109
	7.2	Understanding food and beverage consumers and their	
		world	111
	7.3	Consumer-centric company culture for innovation	115
	7.4	Consumer-driven innovation process	117
	7.5	Consumers as co-creators	127
	7.6	Conclusion	132
	7.7	Future trends	133
	7.8	Sources of further information and advice	134
	7.9	References	135
8	Co-c	reation of value with consumers as an innovation strategy	
	in th	e food and beverage industry: the case of Molson Coors'	
	'talk	ing can'	139
	М. G	arcia Martinez, Kent Business School, University of Kent, UK	
	8.1	Introduction	139
	8.2	Co-creation of value with consumers	141
	8.3	Research design	142
	8.4	Molson-Coors Brewing Company UK (MCBC-UK): the	
		need for consumer-driven innovation	142
	8.5	The discover style of open innovation	145
	8.6	The 'talking can': co-creating value with consumers	146
	8.7	Discussion	
	8.8	Conclusion	151
	8.9	References	151

9	Collab	oorative product innovation in the food service industry.	
		many cooks really spoil the broth?	154
		Costa, The Catholic University of Portugal, Portugal	
	9.1	Introduction	154
	9.2		156
	9.3	Collaborative product innovation (CPI) in the food-service	
	2.00	industry: the path of diffusion of sous vide cooking in	
		the US	160
	9.4	Conclusions and future trends	
	9.4 9.5	References	
	9.5	References	1/1
10	Effecti	iveness of cluster organizations in facilitating open	
		tion in regional innovation systems: the case of Food	
		in the Netherlands	174
	-	F. Omta, Wageningen University and Research Centre,	
		therlands and F. T. J. M. Fortuin, Food Valley Organization,	
		etherlands and Wageningen University and Research Centre,	
		therlands	
	10.1		174
	10.1	Theoretical background	175
	10.2	The Dutch agri-food sector and Food Valley Organization	177
	10.5	Conclusions	183
	10.4	Future trends	183
	10.5	Sources of further information and advice	184
			185
	10.7	References	185
	10.8	Appendix 1: the four main functions of Food Valley, including	107
	10.0	fifteen services, activities and information sources	186
	10.9	Appendix 2: assessment of small to medium-sized enterprises	
		and large companies of the importance of Food Valley	
		functions	187
	10.10	Appendix 3: member company assessment of the importance	
		of Food Valley functions by company type	188
11	The		
11		portance of networks for knowledge exchange and ition in the food industry	190
		•	192
		ne, V. Lefebvre, C. Cochez and X. Gellynck, Ghent	
		sity, Belgium	100
	11.1	Introduction	189
	11.2	Knowledge exchange and innovation and the importance	100
		of networks	190
	11.3	Network methodology: a case study approach	195
	11.4	Results of the three Flemish case studies	198
	11.5	Conclusions and future trends	207
	11.6	References	208

Part III	Establishing and managing open-innovation partnerships and
	networks

12 Managing open-innovation communities: the development				
		ation community scorecard	215	
	I. Blohm, University of St. Gallen, Switzerland, J. M. Leimeister,			
	Kassel University, Germany and H. Krcmar, Technische Universität			
		nen, Germany	.	
	12.1 12.2	Introduction Introduction to open-innovation communities and their	215	
	12.2	management	217	
	12.3	Development of an open-innovation community scorecard		
	12.5	Implementation of the open-innovation community scorecard		
	12.4	Conclusion and future trends		
	12.5	References		
	12.0	Appendix 1: data sources of success measures		
	12.7			
		Appendix 2: member survey	234	
13		volution of partnering in open innovation: from transactions		
		nmunities	235	
		McFarthing, Innovation Fixer Ltd, UK		
	13.1	Introduction		
	13.2	Identifying and securing partners		
	13.3	Building and structuring relationships		
	13.4	Ecosystems		
	13.5	Human factors		
	13.6	Building a community		
	13.7	Conclusion		
	13.8	Acknowledgements		
	13.9	References	252	
14	Mana	ging co-innovation partnerships: the case of Unilever and its		
		red flavour suppliers	254	
		pic and S. W. F. Omta, Wageningen University and Research		
		e, The Netherlands, F. T. J. M. Fortuin, Food Valley Organiza-		
		he Netherlands and Wageningen University and Research		
		e, The Netherlands and A. Saris, Wageningen University and		
	Research Centre, The Netherlands			
	14.1	Introduction	254	
	14.2	Co-innovation		
	14.3	The co-innovation partnership between Unilever and flavour		
		suppliers	260	
	14.4	Implementation and development of the Flavour Operating		
		Framework partnership	262	
	14.5	Conclusion		
	14.6	Future trends		
	14.7	References		

15 Managing asymmetric relationships in open innovation: lesson from multinational companies and SMEs		276		
	D. Oughton, University of Cambridge, UK and L. Mortara and T.			
	Minshall, IfM Centre for Technology Management, UK			
	15.1	Introduction: the importance of large and small company		
		partnerships in the food industry	276	
	15.2	The difficulties of open innovation	278	
	15.3	Culture, complexity and communication problems	281	
	15.4	The importance for companies of focusing on risk, reward		
		and balance	283	
	15.5	Overcoming obstacles to achieve successful company		
		partnerships	284	
	15.6	Collaborations between companies: case studies	287	
	15.7	Conclusion	289	
	15.8	Acknowledgements	291	
	15.9	References	292	
16	Challe	enges faced by multinational food and beverage corporations		
10			294	
		hurst and J. Brown, Oakland Innovation, UK		
	16.1	Introduction	294	
	16.2	Strategic external networks for open innovation		
	16.3	Research methodology		
	16.4	Findings		
	16.5	Discussion		
	16.6	Future trends		
	16.7	Conclusions and recommendations		
	16.8	References		
Par	t IV	Open innovation tools, process and managerial frameworks		
17	The 'v	vant find get manage' (WFGM) framework for open-		
			315	
		rcia Martinez, Kent Business School, University of Kent, UK		
	17.1	Introduction	315	
	17.2	History of open innovation at Mars, Incorporated		
	17.3	Mars' open-innovation model		
	17.4	The open-innovation framework: 'want find get manage'		
	17.5	Conclusions		
	17.6	References	330	
18	Crowd	lsourcing: the potential of online communities as a tool		
			332	
		rcia Martinez and B. Walton, Kent Business School,		
		rsity of Kent, UK		
	18.1	Introduction	332	
	18.2	Predictive modelling competitions		

	18.3	Design and management of predictive modelling competitions.	335
	18.4	Case study: Kaggle	338
	18.5	Conclusions	340
	18.6	References	340
19	The re	ole of information systems in innovative food and	
		age organizations	343
	J. G. C	Caudill, University of Tennessee, USA	
	19.1	Introduction	343
	19.2	The role of technology in innovation	344
	19.3	Innovative technologies in agriculture and food production	345
	19.4	Technology's support of innovation	347
	19.5	Free tools for innovation	352
	19.6	Future trends	353
	19.7	Conclusion	
	19.8	Sources of further information and advice	354
	19.9	References	354
20	Effect	ive organizational and managerial frameworks to support	
	open i	nnovation: overview and the case of Heinz	356
	V. Laz	zarotti and R. Manzini, Cattaneo University – LIUC, Italy	
	20.1	Introduction	356
	20.2	The need for organizational and management tools to	
		support open innovation	357
	20.3	Case study: Heinz's strategy, business and organization	360
	20.4	Conclusions and managerial implications	366
	20.5	References	367
21	Innov	ating with brains: the psychology of open innovation	369
	B. A. S	Sabel, University of Magdeburg Medical School, Germany and	
	Institu	te of Automation, China, K. Sabel, Consulting-Berlin,	
	Germa	any and J. T. Preston, TEM Capital and Continuum Energy	
	Techno	ologies, USA	
	21.1	Introduction	
	21.2	Innovation is all about psychology	370
	21.3	Phases of innovation	371
	21.4	The influence of soft factors on the success of innovation	373
	21.5	The psychology of the innovation team	380
	21.6	The innovative environment of academia	382
	21.7	Start-ups and small to medium-sized enterprises (SMEs):	
		open innovation by default	385
	21.8	Predicting innovation success: the 'Preston' equation	385
	21.9	Future trends	386
	21.10	References	387
Ind	ex		389

664 OPE

Contact "Library Services" : info@dss.go.th

Index

academia innovative environments 382-4 avoidance of bringing innovation to market. 384 source of innovation, 382-4 agri-food sector, 74-7 agricultural innovation. 362 alliance framework, 239 appropriability factor, 27-8 articulation, 191 asymmetric partnership case studies of collaborations between companies, 287-9 Ben and Jerry's supporting socially responsible start-ups, 289 (INP) and (SiW) model, 287-8 Tate & Lyle the novel salt-reduction technology, 288 Unilever open-innovation infrastructure, 288-9 open innovation in multinational companies and SMEs, 276-91 culture, complexity and communication problems, 281-3 difficulties, 278-81 risk, reward and balance importance, 283-4 overcoming obstacles to achieve successful company partnerships, 284-7 company organisation and culture, 285-6 ongoing relationship management, 286-7

process technology readiness and shared roadmaps, 284-5 setting up the deal, 286 shared vision and agreed business model strategy, 284 balanced scorecard, 220 Before-Noccior, 32-4 biosensors, 346 Bivio Vela, 101 central location testing (CLT), 124 closed innovation. 29-32 innovation process at Lindt, 29-30 organisational units that deal with innovation and their competencies, 30 cluster organisation (CO) Dutch agri-food sector and Food Valley Organisation, 177-83 effectiveness in open innovation in regional innovation system, 174-88 future trends, 184 theoretical background, 175-7 role in open innovation, 177 co-creation, 127-32 consumer as innovation strategy in food and beverage industry, 139-50 Molson Coors Brewing Company UK. 142-4 open innovation style, 145-6 research design, 142 co-innovation openness and tradition, 25-36

Lindt case results, 34-6 Lindt case study method, 28-9 Noccior innovation project, 32-4 open and closed innovation at Lindt. 29-32 open innovation studies, 26-8 phases, 256-60 evaluation, 259-60 formalisation, 258-9 implementation, 259 initiation, 256-7 partner selection, 257-8 Unilever and flavour suppliers, 254-72 Flavour Operating Framework implementation and development, 262-7 future trends, 272 co-operation agreement, 82-4 cognition, 378-80 curiosity and novelty-seeking behaviour, 378-9 divergent thinking and creativity, 379-80 frustration tolerance and persistence, 380 intelligence, 380 collaboration agreement, 89 collaborative product innovation (CPI), 157-8 food service industry, 154-71 future trends, 170-1 open innovation in the food industry, 156-60 drivers, 156-7 initiatives, 158-60 main characteristics, 159 sous vide technology in the US, 160-70 combination, 191 communication, 282-3 innovation, 67, 347 community selecting, engaging and managing partners for open innovation, 235-52 building and structuring relationships, 239-43 community building, 249-51 ecosystems, 243-6 human factors, 246-9 identifying and securing partners, 236-9 competence gaps, 53-6 competence sourcing, 54-5

complementary industry convergence, 43 complexity, 281-2 computer supported collaborative work (CSCW), 349-50 computerisation, 134 confidential disclosure agreement (CDA), 238 Connect & Develop open-innovation program, 246 consumer co-creation value as innovation strategy in food and beverage industry, 139-50 key factors to successful open innovation, 150 Molson Coors Brewing Company UK. 142-4 open innovation style, 145-6 research design, 142 food and beverage industry innovation, 109-34 co-creators, 127-32 consumer-centric company culture, 115-17 future trends, 133-4 objective, 111-15 project process, 117-27 consumer behaviour, 111 consumer-centric corporate culture, 115-16 incorporating consumer mindset into company culture, 116 consumer-conscious employees, 116-18 consumer-driven innovation co-creation value in food and beverage industry, 139-50 consumer-centric company culture, 115-17 consumers as co-creators, 127-32 food and beverage industry, 109-34 future trends, 133-4 Molson Coors Brewing Company UK. 142-4 organisational structure, 144 objective, 111-15 consumer-related variables influencing food and beverage choice and consumption, 112-13 environmental variables influencing food and beverage choice and consumption, 114 product-related variables influencing food and beverage choice and consumption, 113

open innovation style, 145-6 project process, 117-27 concept classification based on liking and purchase intent scores, 123 consumer-driven tolerance for a quality attribute, 126 consumer input, 118-20 overview, 117-18 preference mapping of savoury snack bars, 125 sample, 122-7 selected consumer research techniques application, 121 test design considerations, 120 tools, 120-2 consumer input, 118-20 business case, 118 concept, 118 development, 119 launch, 119 opportunity identification, 118 post launch evaluation, 119-20 validation before launch, 119 consumer segments, 113 controlled open innovation Lindt case results, 34-6 opposing forces of the openness degree, 35 openness and tradition, 25-36 Noccior innovation project, 32-4 open and closed innovation at Lindt, 29-32 research method for Lindt case study, 28-9 review of open innovation studies, 26-8 creative process, 350-1 crowdsourcing, 249, 351-2 potential tool for data analysis, 332-40 design and management of predictive modelling competitions, 335-8 Kaggle case study, 338–9 predictive modelling competitions, 333-5 Cuisine Solutions, 168-9 Culinary Brands, 168 culture, 281 CuteFarm, 352 data analysis

crowdsourcing and online communities, 332–40

design and management of predictive modelling competitions, 335-8 Kaggle case study, 338-9 predictive modelling competitions, 333-5 deep ties, 194-5 demand articulation support, 182, 183 DEWmocracy, 131-2 DSM, 56 Dutch agri-food sector, 177-8 demand uncertainty obstructing innovation, 178 ecosystem network, 297 ego issues, 374-5 founders, 375 investors, 374-5 management, 374 environment, 115 European Patent Office (EPO), 8 evaluation phase, 259-60 exploitative ties see deep ties explorative ties see wide ties external innovation expenditure, 84-5 R&D department of Spanish firms and agri-food firms, 85 external knowledge acquisition countries distribution, 19 data sources and types, 8-9 first European patent applications in agrifood patent families (1998-2006), 9 external knowledge sources, 19 firm differences, 19-20 open innovation trends in food industry, 3-20 technological knowledge types, 19 External Partner Development (XPD), 243 extrinsic motivation, 376

Flanders' FOOD, 198, 206–7 Flavour Operating Framework Partnership implementation and development, 262–7 implementation phase, 265–7 initiation phase, 262–3 partner-selection phase, 263–4 partnership-evaluation phase, 267 partnership-formalisation phase, 264–5 food and beverage industry co-creation value with consumer

innovation strategy, 139-50 key factors to successful open innovation, 150 Molson Coors Brewing Company UK, 142-4 open innovation style, 145-6 research design, 142 consumer-driven innovation, 109-34 consumer-centric company culture, 115-17 consumers as co-creators, 127-32 future trends, 133-4 objective, 111-15 project process, 117-27 knowledge exchange, innovation and knowledge exchange, 190-3 role of information systems in innovative organisations, 343-54 agriculture and food production technologies, 345-7 future trends, 353 innovation free tools, 352 innovation support technology, 347-52 technology in innovation, 344-5 food industry collaborative product innovation (CPI), 154-71 future trends, 170-1 open innovation, 156-60 sous vide technology in the US, 160-70 external knowledge acquisition trends for open innovation, 3-20 countries distribution, 19 data sources and types, 8-9 external knowledge sources, 19 firm differences, 19-20 measuring open innovation, 6-8 open innovation study results, 9-18 reasons for open innovation, 4-6 technological knowledge types, 19 networks for knowledge exchange and innovation, 189-208 Flemish case studies, 195-207 food and beverage industry, 190-3 future trends, 207-8 role, 193-5 open innovation role in industry convergence, 39-58 challenges and role, 43-7 coping in the NFF sector, 51-6 evidence, 47-51

future trends, 58 studies, 40-3 types of open innovation in industry convergence, 58 food product, 114 food technology, 4 mostly incorporated technological knowledge types, 10–11 Food Valley Organisation, 174-88, 179 data and methods, 180-1 response rates for various types of companies, 180 functions, 179-80 results, 181-3 functions assessed by different types of companies, 182 functions assessed by large companies and SMEs, 181 formal interaction, 194 formal relationship, 194 formalisation phase, 258-9 'free revealing' process, 3 General Mills, 358–9 global external innovation team (GEIT), 365

Global Innovation and Quality Centre, 361 global reach, 303 globalisation, 27

Heinz case study of strategy, business and organisation, 360-6 food quality and safety, 360 innovation. 362 open-innovation model, 363-5 organising and managing open innovation, 365-6 relationship with suppliers, 360-1 research and development (R & D), 361 effective organisational and managerial framework for open innovation, 356-66 managerial implications, 366 need for support tools, 357-9 home use testing (HUT), 124 hub and spokes network, 296-7 hybrid products, 51 Hypermodern Cuisine, 163-4 idea-driven innovation, 68 inbound open innovation, 6 industry convergence

challenges and open innovation role, 43-7 coping, 45-7 'industry recipes' and converging sectors, 45 missing competence and pathdependency, 44 standards and absorptive capacity, 44-5 evidence in food and pharmaceuticals, 47-51 regulations, 50-1 future trends, 58 open innovation role in food and pharmaceutical industries, 39-58 studies, 40-3 input-side and output-side convergence, 41 patterns, 40-1 regulation, 42-3 special situation for innovation, 43 informal interaction, 194 informal relationship, 194 information and communication technology (ICT), 345, 348-9 information systems innovation support technology, 347-52 computer supported collaborative work (CSCW), 349-50 information and communication technology (ICT), 348-9 role in innovative food and beverage organisations, 343-54 agriculture and food production technologies, 345-7 future trends, 353 innovation free tools, 352 technology in innovation, 344-5 innovation information systems in food and beverage organisations, 343-54 agriculture and food production technologies, 345-7 free tools, 352 future trends, 353 support technology, 347-52 technology in innovation, 344-5 innovation acceleration, 67 innovation co-operation, 82-4 breadth, 84 degree in Spanish firms and agri-food firms, 83 innovation ecosystem, 67 innovation funnel, 30 innovation partnerships (INP), 287

innovation performance agri-food sector, 74-7 impact of open innovation, 74-92 measurement, 219 open innovation in Spanish agri-food firms, 80-5 external information search, 82 idea sources, 81-2 openness effect, 85-91 firm innovative performance for agri-food firms, 90 firm innovative performance for Spanish firms in general, 88 variables correlation analysis on firm behaviour, 87 Spanish agri-food firms, 77-80 innovation process support, 182 innovation system (IS), 175, 176 institutional barrier, 100 intellectual property, 28, 70, 99, 106, 150, 242, 320, 359 management, 278 intellectual property rights (IPR), 264 intermediation company innovation research, 64-5 future trends, 71-2 collaborative sustainability, 72 innovation portals, 72 value chain open innovation, 72 idea-driven to need-driven innovation, 68 Kraft melt-chocolate bars, 68-70 open innovation capabilities, 65-8 company growth, 65-6 open innovation cycle acceleration, 63-72 internal innovation expenditure, 84-5 R&D department of Spanish firms and agri-food firms, 85 internalisation, 191 International Flavours and Fragrances (IFF), 158 International Patent Classification (IPC), 8 internationalisation, 101-2 interrupted catering system, 162-3 intrinsic motivation, 376 **IRRISTAT, 352** Kaggle, 338-9 data modelling contests typology, 339 knowledge accumulation, 191

Knowledge Discovery and Data Mining (KDD) Challenge Cup, 334 knowledge diversity, 337 knowledge exchange Flemish case studies, 195-207 Belgian networks studied, 197 network role in food industry innovation, 201-3 networks process, 198-201 results. 203-7 sections of semistructured interview guide and main respondent categories, 196 similarities and differences highlights, 204-5 future trends, 207-8 knowledge exchange and innovation in food and beverage industry, 190-3 networks for innovation in the food industry, 189-208 role, 193-5 knowledge exploitation, 192 knowledge intensive business service (KIBS), 97-9 knowledge transformation, 192 Kraft. 68-70 laddering, 123 large company perspective difficulties of open innovation, 278-9 brand protection, 278 culture, 279 financial stability, 279 managing intellectual property, 278 technology readiness, 279 lead users, 224 learning, 190 Likert Scale, 180 Lindt controlled open innovation | approach, 25-36 case results, 34--6 case study method, 28-9 Noccior innovation project, 32-4 open and closed innovation, 29-32 open innovation studies, 26-8 Magic corner, 321 maitre chocolatiers, 31 market-driven output-side convergence, 42 NFF sector, 49-50 food and drug market trends, 49 product functions of nutraceuticals

and functional foods vs. drugs, 50

Mars, Incorporated

want find get manage (WFGM) framework for open-innovation management open-innovation framework, 322-28 open innovation history, 317 open-innovation model, 317-21 want find get manage (WFGM) framework for open-innovation management, 315-30 master joint development agreement (MJDA). 359 means-end chain-theory, 123 medium-sized enterprise (SME) knowledge exchange and innovation, 192-3 melt proof chocolate bar, 68-70 mergers and acquisitions (M&A), 54, 55 Molecular Gastronomy see Hypermodern Cuisine Molson Coors Brewing Company UK, 139-50, 142-4 organisational structure, 144 Mountain Dew, 131-2 multinational companies difficulties, 278-81 large company perspective, 278-9 small-company perspective, 279-81 food and beverage, challenges of strategic external networks for open innovation, 294-310 discussion, 304-5 future trends, 305 recommendations, 305-10 research methodology, 298-9 results, 299-304 SMEs and, asymmetric partnership in open innovation, 276-91 collaborations between companies, 287-9 culture, complexity and communication problems, 281-3 overcoming obstacles to achieve successful company partnerships, 284-7 risk, reward and balance importance, 283-4 national innovation system, 175-6 need-driven innovation, 65, 66-8, 68 Nestlé Health Sciences, 55 networks Flemish case studies, 195-207 Belgian networks studied, 197 process, 198-201

results, 203-7 role in food industry innovation, 201-3 sections of semistructured interview guide and main respondent categories, 196 similarities and differences highlights, 204-5 future trends, 207-8 knowledge exchange and innovation in food and beverage industry, 190-3 knowledge exchange and innovation in food industry, 189-208 role in knowledge exchange and innovation, 193-5 New Cookery see Hypermodern Cuisine New Food Economy, 5 new product development (NPD), 46-7, 53, 110, 117 Noccior, 32–4 phases and involved partners, 34 non-patent citation (NPC), 7-8, 9-10, 10-11, 11-12, 16 non-pecuniary open innovation, 6 nondisclosure agreement (NDA), 278, 321 Novartis, 56 nutraceuticals, 47-8 emerging inter-industry segment of NFF, 48 food and pharmaceuticals convergence, 48 nutraceuticals and functional food (NFF) sector, 47, 57 market-driven output-side convergence, 49-50 open innovation to cope with convergence, 51-6 technology-driven input-side convergence, 48-9 nutrigenomics, 49 nutrigenomics organisation (NuGO), 54 nutrition innovation, 362 online communities crowdsourcing tool for data analysis, 332-40 design and management of predictive modelling competitions, 335-8

Kaggle case study, 338–9

competitions, 333-5

predictive modelling

open business models, 241

Open CASCADE, 352 open communication, 266 open innovation, 29-32, 155, 217 asymmetric partnership in multinational companies and SMEs, 276-91 collaborations between companies, 287–9 culture, complexity and communication problems, 281-3 difficulties, 278-81 importance of partnership, 276-8 overcoming obstacles to achieve successful company partnerships, 284-7 risk, reward and balance importance, 283-4 cluster organisation effectiveness in regional innovation system, 174-88 Dutch agri-food sector and Food Valley Organisation, 177–83 future trends, 184 theoretical background, 175-7 convergence-related challenges and role, 43–7 coping, 45–7 'industry recipes' and converging sectors, 45 missing competence and pathdependency, 44 standards and absorptive capacity, 44-5 coping with convergence in the NFF sector, 51-6 close competence gaps, 53-6 competence differences of actors, 52 competence gaps arising in NPD, 53 missing competence, 52-3 countries distribution, 19 cycle acceleration through intermediation, 63-72 capabilities, 65-8 company research, 64-5 creating good environment, 70 future trends, 71-2 idea-driven to need-driven innovation, 68 Kraft melt-chocolate bars, 68-70 ownership of the problem, 70 resource allocation, 71 span of control, 70-1 timelines and budget, 71 data sources and types, 8-9 first European patent applications in

agri-food patent families (1998-2006), 9 discover style, 145-6 effective organisational and managerial framework, 356-66 case study of Heinz's strategy, business and organisation, 360-6 managerial implications, 366 need for support tools, 357-9 experimentation, 31 external collaboration challenges in multinational food and beverage corporation, 294-310 discussion. 304-5 future trends, 305 recommendations, 305-10 research methodology, 298-9 results, 299-304 external knowledge acquisition trends in food industry, 3-20 firm differences, 19-20 Flemish case studies, 195-207 Belgian networks studied, 197 network role in food industry, 201-3 process of knowledge exchange in networks, 198-201 results, 203-7 sections of semistructured interview guide and main respondent categories, 196 similarities and differences highlights, 204-5 future trends, 58, 207-8 impact on innovation performance, 74-92 agri-food sector, 74-7 measurement in Spanish agri-food firms, 80-5 openness effect, 85-91 Spanish agri-food firms, 77–80 influence of soft factors, 373-80 anxiety and fear or lightness of being, 373-4 personality factors, 373 innovation process at Lindt, 29-30 organisational units that deal with innovation and their competencies, 30 knowledge exchange and innovation in food and beverage industry, 190-3 manufacturing, 31-2 Lindt open innovation funnel, 32 measurement, 6-8 networks for knowledge exchange in

the food industry, 189-208 new concept generation, 31 new developments, 31 packaging, 31 phases, 371-2 practices in the food industry, 156-60 CPI initiatives in the food industry, 158-60 drivers, 156-7 main characteristics, 159 psychology, 369-87 environments of academia, 382-4 future trends, 386-7 start-ups and SME's, 385 success prediction and Preston equation, 385-6 team, 380-2 public research centres, private technical and scientific service providers, 97-107 actors in the technology market, 98 managerial implications, 105-7 reasons, 4-6 role, 193-5 role in food and pharmaceutical industries convergence, 39-58 selecting, engaging and managing partners from transactions to communities, 235-52 building and structuring relationships, 239-43 community building, 249-51 ecosystems, 243-6 human factors, 246-9 identifying and securing partners, 236-9 soft factors influence on innovation success ambition, 377 cognition, 378-80 communication and charisma, 377 creative urge and innovative power, 377 ego issues, 374-5 passion and other motivators, 376-7 team spirit, 377-8 strategic external networks, 294-310 studies review, 26-8 external factors, 26-7 firm-specific factors, 27-8 study results, 9-18 differences across countries, 11-13 differences across firms, 13-15

patents and applicant citations by country, 12 top patenting companies and citations by sector (1998-2006), 14-15want find get manage (WFGM) framework of Mars, Incorporated, 315 - 30framework, 322-28 history at Mars, 317 Mars model, 317-21 open-innovation academy, 247 open-innovation community cause and effect linkages between performance parameters, 227-8 exemplary strategy map, 227 strategy map relationships, 227-8 financial perspective, 225 goals and performance measures, 225 innovation-performance measurement, 219 learning perspective, 224-5 customer's goals and performance measures, 225 member perspective, 223-4 goals and performance measures, 223 process perspective, 220, 222-3 goals and performance measures, 222 scorecard development, 215-34 future trends, 229-30 implementation, 228-9 overview, 217-19 schematic diagram, 221 shortcomings of existing approach, 220 virtual communities, 217-19 building and management model, 218 open-innovation model Heinz, 363-5 schematic diagram, 364 openness degree, 26 OpenSim, 352 organisation framework effective managerial framework to support open innovation, 356-66 case study of Heinz's strategy, business and organisation, 360-6 managerial implications, 366 need for support tools, 357-9 outbound open innovation, 6-7

packaging, 125 packaging innovation, 362 partnership building and structuring relationships, 239-43 defining boundaries, 240 intellectual property (IP), 242 organisation structuring. 242-3 small company perspective, 243 spoils sharing, 241 strategic alliances, 239-40 ecosystems, 243-6 building, 244 physical, 245-6 supplier networks, 244-5 human factors, 246-9 choosing and training people, 247 communication and conflict, 247-9 I win vs we win, 246 maintaining relationship, 249 identifying and securing partners, 236-9 cultural fit assessment, 238 identification and selection criteria, 237-8 partner definition, 237 readiness to build partnerships, 237 strategic context, 236 managing co-innovation partnership, 254-72 co-innovation between flavour suppliers, 260-2 Flavour Operating Framework implementation and development, 262-7 future trends, 272 recommendations, 271 success factors, 269-71 selecting, engaging and managing for open innovation, 235-52 community building, 249-51 patent citation (PC), 6, 7-8, 9-10, 10-11, 11 - 12, 13, 16Patent Statistical Database, 8-9 patented food technology, 5 knowledge source, 9-10 origin of citations in agrifood patents by sectors (1998 - 2006), 10open innovation trend, 16-18 external knowledge incorporation in agri-food sectors, 16, 17 external knowledge incorporation in sector 14, 17

external knowledge incorporation in sector 25, 18 external knowledge incorporation in sector 14-25, 18 path dependence, 238-9 pecuniary open innovation, 6 pharmaceutical industry open innovation role in industry convergence, 39-58 challenges and role, 43-7 coping in the NFF sector, 51-6 evidence, 47-51 future trends, 58 studies, 40-3 types of open innovation in industry convergence, 58 PLATO, 198, 199, 202, 206-7 predictive modelling competitions, 333-5 design and management, 335-8 identification of right crowds, 335-7 right innovation problem, 337 security and privacy implications in data mining, 337-8 distinguishing features and ideas competitions, 335 preference mapping, 124 Preston equation, 385-6 priori, 222 private technical and scientific service providers open innovation, 97-107 role, 99-100 psychology innovation team. 380-2 academia and commercial/financial world gap, 381 features of academic and business world, 382 investor relations, 381-2 team psychology, 380-1 open innovation, 369-87 environments of academia, 382-4 future trends, 386-7 influence of soft factors, 373-80 phases, 371-2 start-ups and SME's, 385 success prediction and Preston equation, 385-6 public research centres, 98 open innovation, 97-107 role, 100-1

qualitative consumer testing, 123 quality assurance (QA), 119

quality control (QC), 119 quantitative concept testing, 123 regional innovation system (RIS) cluster organisation effectiveness in open innovation facilitation, 174-88 Dutch agri-food sector and Food Valley Organisation, 177-83 future trends, 184 theoretical background, 175-7 relational alignment, 257-8 research and development (R&D), 26-8, 64, 78, 84-5, 102, 103, 110-11, 117 collaboration in the NFF sector, 55-6 number of patents to industrial background of filling companies, 55 networks for developing new technology platforms for NFF sector, 54 research methodology, 298-9 resource-based view (RBV), 45 Riso Scotti, 97-107, 101-5 innovation, 102 managerial implications, 105-7 open innovation approach, 103-5 illustration, 105 process innovation, 103 product innovation, 102-3 SAPiens research project, 228 science-technology relationship, 6 scorecard implementation, 228-9 data sources of success measures, 232-3 member survey, 234 open-innovation community management, 215-34 development, 219-28 future trends. 229-30 overview, 217-19 senior buy-in, 300 sharing is winning (SiW) model, 287, 359 simulated test market (STM), 126 simulation modelling, 346 small-company perspective difficulties of open innovation, 279-81 absorptive capacity, 280-1

changing points of contact, 280 company roles, 280 how to engage, 279

lack of start-up knowledge, 281

power imbalance, 280 slow decision cycles, 280 small to medium enterprise (SME) difficulties, 278-81 large company perspective, 278-9 small-company perspective, 279-81 multinational companies and, asymmetric partnership in open innovation. 276-91 collaborations between companies, 287-9 culture, complexity and communication problems, 281-3 overcoming obstacles to achieve successful company partnerships, 284-7 risk, reward and balance importance, 283-4 small to medium-sized enterprise (SME), 74-6, 175, 181-3, 183-4 socialisation, 191 **SODA-LO. 288** soft skills, 247 sous vide, 160-70 case study, 165, 168-70 R&D effort and net sales of Cuisine Solutions, 169 methodology, 164-5 case information, 166-7 overview. 160-4 cooking process, 161 food supply chain, 162 Spanish agri-food firms, 74–92 innovation, 77-80 input, 78 output, 80 percentage of firms, products and process, 79 open innovation measurement, 80-5 external information search, 82 idea sources, 81-2 specialisation, 99-100 spillovers, 3 staff turnover, 300 strategic alliances, 239-40 partnership governance factors, 240 strategic external networks, 294-310 benefits and drawbacks, 297-8 definition, 295 open innovation of multinational food and beverage corporations, 294-310 discussion, 304-5 future trends, 305

hub and spokes network and ecosystem network, 297 recommendations, 305-10 research methodology, 298-9 purpose, 296 results, 299-304 challenges, 300-4 current status for open innovation in food and beverage industry, 299-300 types, 296-7 strategic open-innovation networks, 295 strategical alignment, 257-8 substitutive industry convergence, 43 T profile, 247 tactical open-innovation networks, 295 talking can, 139-50 co-creation of value with consumers, 141-2, 146-9 value creation innovation by open innovation, 147 open innovation style, 145-6 research design, 142 target consumer, 113 technological alignment, 257-8 technological convergence, 27 Technological Innovation Panel (PITEC), 77, 79 technological intensity, 26-7 technological knowledge, 3, 4, 5 types mostly incorporated in food technology, 10-11 applicant citations by sector and cited technological fields (1998-2006), 11 technological turbulence, 27 technology-driven input-side convergence, 41-2 NFF sector, 48-9 technology ladder, 148 ten-step guide, 306-10 candidates selection, 308 definition and candidate selection, 309 define the need, 306 develop clear selection criteria, 306 partner selection criteria attributes, 307 engagement process, 308 evaluate and rank partners, 308 external audit, 307-8 internal audit and gap analysis, 306-7 network review, 309–10 nurture the network, 308–9 refresh network periodically, 310 running network steps, 310 thermochromic device, 148

Unilever co-innovation phases, 256-60 evaluation, 259-60 formalisation, 258-9 implementation, 259 initiation, 256-7 partner selection, 257-8 Flavour Operating Framework Partnership implementation and development, 262-7 future trends, 272 managing co-innovation partnerships, 254-72 co-innovation between flavour suppliers, 260-2 university, 98, 100-1 university-industry collaboration, 100, 105 VLAZ, 198, 201, 203, 206-7

W. R. Grace, 165, 168 WANT, 143, 146, 151 want find get manage (WFGM) framework, 358

open-innovation framework, 322-8 decision making process, 324 Find and selecting the right partner, 325 Get and setting up win-won solutions, 326-8 getting access to right competencies, 327 Manage and making the most out of relationships, 328 Mars ecosystem mapping, 325 want find get manage model, 322 Want and creating consumer value, 322-5 open-innovation management of Mars, Incorporated, 315-30 history, 317 open-innovation framework, 322-8 open-innovation model, 318–22 Mars' global open-innovation structure, 319 organisational structure, 318 reward and incentive systems, 321-2 team leading cultural change, 319, 320-1 Web 2.0, 350-1 wide ties, 195 win-win strategy, 149 Xpholon, 352