Institute of Farm Economics

Johann Heinrich
von Thünen-Institut
Federal Research Institute
for Rural Areas, Forestry
and Fisheries

Evaluation of the Impact of Milk quota – Case Study Germany

Werner Kleinhanß, Frank Offermann and Markus Ehrmann

Arbeitsberichte aus der vTI-Agrarökonomie

07/2010

Braunschweig/Germany, July 2010

Werner Kleinhanß, Frank Offermann und Markus Ehrmann sind wissenschaftlicher Mitarbeiter am Institut für Betriebswirtschaft des Johann Heinrich von Thünen-Instituts.

Adresse: Institut für Betriebswirtschaft

Johann Heinrich von Thünen-Institut (vTI),
Bundesforschungsinstitut für Ländliche Räume, Wald und Fischerei

Bundesallee 50

38116 Braunschweig/Germany

Telefon: +49 531 596-5151

E-Mail: werner.kleinhanss@vti.bund.de

Die *Arbeitsberichte aus der vTI-Agrarökonomie* stellen vorläufige, nur eingeschränkt begutachtete Berichte über Arbeiten aus dem Institut für Betriebswirtschaft, dem Institut für Ländliche Räume und dem Institut für Marktanalyse und Agrarhandelspolitik des Johann Heinrich von Thünen-Instituts dar. Die in den Arbeitsberichten aus der vTI-Agrarökonomie geäußerten Meinungen spiegeln nicht notwendigerweise die der Institute wider. Kommentare sind erwünscht und sollten direkt an die Autoren gerichtet werden.

Der vorliegende Arbeitsbericht kann unter
http://www.vti.bund.de/en/ institute/bw/publikationen/bereich/ab_07_2010_en. pdf
kostenfrei heruntergeladen werden.

Kurzfassung

Zur Zeit der Einführung des Quotensystems war die Struktur der Milchproduktion in Deutschland eher ungünstig. Durch die anfängliche strikte Flächenbindung der Quote wurden strukturelle Anpassungen behindert. Die Einführung des Quotentransfers ohne Land im Jahr 1993 erleichterte betriebliches Wachstum und die Verlagerung der Quote zu den besten Wirten und Standorten (innerhalb der Übertragungsgebiete). Mit der 2000 eingeführten Übertragung über Börsen wurde die Flächbindung aufgehoben und eine bessere Transparenz auf dem Quotenmarkt erreicht. Größere regionale Verlagerungen der Milcherzeugung ergeben sich seit Verringerung der Anzahl der Handelszonen seit 2007. Trotz der Beschränkungen durch das Quotensystem ist der Strukturwandel stark ausgeprägt mit einer annähernden Halbierung der Zahl der Milcherzeuger im Zehnjahreszeitraum.

JEL: Q12, Q18, Q51

Keywords: Milchquote, Agrarpolitik, Strukturwandel, Umwelteffekte

Abstract

At the time of the introduction of the quota system the structure of dairy production in Germany was rather unfavourable. Since 1993, German policy generally aimed at improving quota mobility. The introduction of transfers without land in 1993 facilitated farm growth and the transfer of resources and production to the better farm managers and to locations best suited for dairy production; however the latter was restricted by the regional limitations of the trading zones. The quota auctions introduced in 2000 significantly improved the transparency of quota markets. Larger regional shifts in production will be enabled by the recent reduction of the number of trading zones. Overall, structural change in dairy production has been strong (halving the number of dairy farms every ten years) despite the limitations by the quota system. Still many regions in Germany, notably the case study region of Bavaria, are characterised by small farm structure, where the main share of milk production is still realised by small and medium sized farms.

JEL: Q12, Q18, Q51

Keywords: Milk quota, Agricultural policy, structural change, environmental impacts

Content

List of Tables

List of Figures

1 Introduction

This report is a revised version of a case study prepared for the Evaluation of the Milk Quota regime[1] in 2007/08. Although the focus of evaluation is on environmental impacts the report gives a brief overview on the Dairy sector in Germany and of the case study area in Bavaria. Further it deals with aspects of milk quota regulation in Germany, its implementation and impacts.

This case study is based on several sources. Semi-structured interviews were carried out with experts on the dairy sector from national ministries, research institutions and administrations involved in quota transfers, as well as with dairy farmers in the case study region (see Annex 1 and 3). In addition to a review of published literature and national legislation, published statistics as well as unpublished data provided by the national ministry and interviewed experts were evaluated, complemented by an analysis of information from the EU and the German farm accountancy data networks.

[1] Revised version of a case study report as part of the "Framework contract for the evaluation of the environmental impact of measures taken by common market organisations and CAP direct support measures". Contract No. 30 CE-0067379/00-89; contractor "ALLIANCE ENVIRONNEMENT (Institute for European Environmental Policy (IEEP), London and Oréade-Brèche Sarl, Auzeville". The study has been finished in 2008. The final report of the project is published under http://ec.europa.eu/agriculture/eval/reports/milk_quot_ei/fulltext_en.pdf.

2 Main Characteristics of the Dairy sector in Germany

Milk production is the most important subsector of agriculture in Germany; with milk sales of 7.9 billion € in 2006 it contributes to 40% of animal output and 20 % to total production value. The number of farms with milk production declined from 362,000 in 1985 to approximately 110,000 in 2005. Despite this strong structural change, milk production is still comparatively small structured, particularly in the South. Exceptions are the North of Germany, where dairy farming is concentrated in farms with more than 50 cows, and the new Laender, where farms with 500 to 1,500 cows prevail. Milk yields increased by 100 to 200 kg annually and reach approximately 7,200 in the north and 7,900 kg in the new federal states. In the South, where breeds combing milk and beef production dominate, milk yields are lower by approximately 1,000 kg.

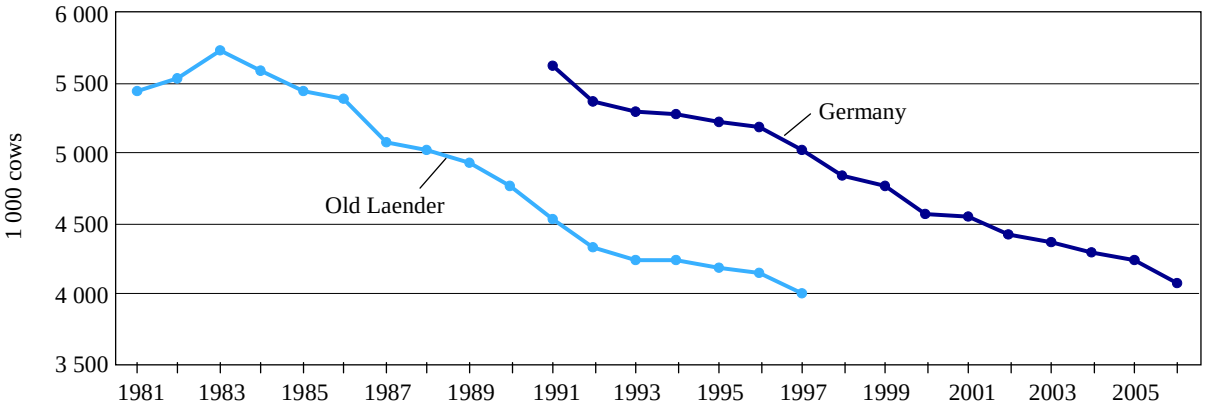
The economic situation of dairy farms seemed to improve after the introduction of the milk quota regulation, but has deteriorated since 1990. Production costs increased as a consequence of high prices for quota and land. The income situation improved in 2007 due to the sudden drastic increase in milk prices by approximately 10 cents/kg. However, feed and energy costs increased as well. In addition, the high subsidisation of biogas production from maize silage leads to a strong competition for land and fodder (maize silage).

2.1 Milk production

2.1.1 Main structural developments in the dairy sector at national level

The number of dairy cows in Germany declined steadily during the last 25 years (Figure 2-1). Before the introduction of the milk quota system (1983) the dairy cow stock was 5.75 million in Western Germany. Due to quota cuts the number declined to 5 million by 1988. After reunification, dairy cows numbered 5.7 million in Germany (1991). Particularly due to improved milk yields the number of dairy cows declined to 4.1 million by 2006. 30 % of dairy cows are kept in Bavaria, 17 % in Lower Saxony and approx. 10 % in Baden-Wurttemberg, Schleswig-Holstein and North Rhine-Westphalia, respectively.

Figure 2-1: Development of the number of dairy cows in Germany



Source: Statistisches Bundesamt, Land- und Forstwirtschaft, Fischerei, Fachserie 3, Reihe 4, Viehbestand und tierische Erzeugung.

The number of farms with milk production declined from 362,000 in 1985 to approximately 110,000 in 2005 (see Figure 2-4, Chapter 2.1.2). Almost 47 % of these farms are located in Bavaria, and 15 % in Lower Saxony and Baden-Wurttemberg, respectively, with only 4,640 farms established in new Laender (Table 2-1).

Table 2-1: Farms with cattle, dairy and suckler cows (2005)

	Farms with			Number of		
	Cattle	thereof		Cattle	thereof	
		Dairy cows	Suckler cows		Dairy cows	Suckler cows
Baden-Wuerttemberg	23 521	14 414	7 091	1 070 254	385 251	58 424
Bayern	69 775	51 880	9 644	3 586 945	1 273 740	65 721
Berlin	9	3	8	436	132	87
Brandenburg	3 102	831	1 869	580 890	174 552	90 452
Bremen	121	62	53	11 273	3 260	657
Hamburg	117	10	68	6 116	753	1 121
Hessen	10 839	5 024	4 413	476 182	157 494	40 201
Mecklenburg-Vorpommern	2 185	897	1 162	539 287	179 093	63 849
Niedersachsen	26 711	15 788	5 529	2 561 585	733 039	76 164
Nordrhein-Westfalen	21 482	9 392	6 589	1 383 653	382 522	69 596
Rheinland-Pfalz	6 426	2 980	3 165	389 678	122 377	47 413
Saarland	813	294	464	53 868	13 948	7 801
Sachsen	4 347	1 409	2 474	501 073	203 446	36 134
Sachsen-Anhalt	1 811	758	927	344 426	137 926	26 028
Schleswig-Holstein	9 610	5 883	2 551	1 179 448	345 068	40 438
Thueringen	2 506	745	1 588	349 358	123 361	36 295
Old Laender	169,424	105,730	39,575	10 719 438	3 417 584	407 623
New Laender	13,951	4,640	8,020	2 315 034	818 378	252 758
Germany	**183 375**	**110 370**	**47 595**	**13 034 472**	**4 235 962**	**660 381**

Source: ZMP, BMELV.

From 1979 to 1983, milk production in Germany (old Laender) increased by 34 % to 25.2 million t., but fell to 23.2 million t. in 1991 due to the quota restrictions. Milk production only gradually increased in the new Laender after 1991 (Table 2-2).

Table 2-2: Milk production in Germany, 1991-2005

Land	1991	1995	2000	2001	2002	2003	2004	2005
Baden-Wuerttemberg	2468	2436	2277	2282	2271	2288	2235	2233
Bayern	8120	7773	7650	7623	7529	7683	7510	7553
Berlin (West)	.	.	1	1	1	1	.	1
Brandenburg/Berlin (Ost)	1221	1221	1356	1345	1333	1365	1350	1385
Bremen	.	.	24	24	24	25	.	24
Hessen	1168	1056	1016	1053	1010	1011	1017	1034
Hamburg	.	.	8	8	7	8	.	7
Mecklenburg-Vorpommern	1258	1230	1350	1339	1327	1360	1377	1383
Niedersachsen	5506	5475	5170	5133	5030	5180	5174	5165
Nordrhein-Westfalen	2728	2817	2683	2683	2670	2721	2709	2750
Rheinland-Pfalz	797	804	775	775	777	789	788	797
Saarland	103	92	89	89	90	91	90	90
Sachsen	1335	1418	1542	1542	1526	1572	1550	1597
Sachsen-Anhalt	889	959	1084	1084	1046	1058	1061	1083
Schleswig-Holstein	2326	2408	2352	2352	2320	2455	2425	2393
Thueringen	960	892	956	956	916	927	925	958
Berlin (West), Bremen, Hamburg	38	.	.	32	32	33	34	32
Old Laender	23254	22898	22044	21986	21727	22252	21,981,3	22048
New Laender	5662	5723	6289	6205	6147	6282	6263	6405
Germany	**28916**	**28621**	**28332**	**28191**	**27874**	**28533**	**28245**	**28453**

Source: ZMP, BMELV.

Milk deliveries to dairies (Table 2-3) declined by 18 % between 1983/84 to 2004/05 in most old Laender. Reductions above average can be recorded in Hessen, Bremen and Hamburg. According to the experts interviewed, quota from Hessen was transferred to Lower Saxony and North Rhine-Westphalia (see Chapter 4). In many regions (i.e. Lower Saxony) milk production was reallocated from arable regions towards grassland regions (Brauschweig and Hannover in favour of the regions Lüneburg and Weser-Ems).

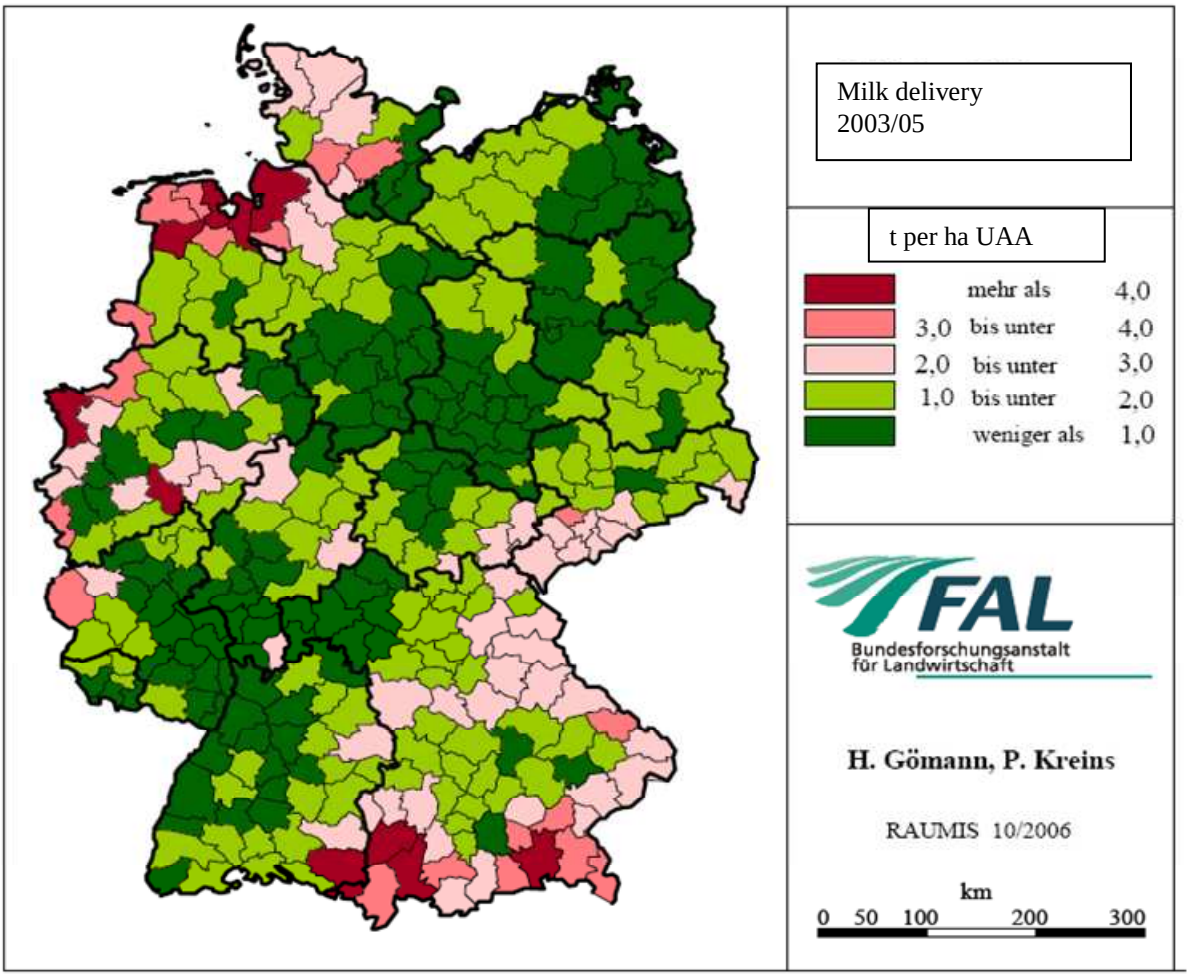
Table 2-3: Development of milk deliveries

Land	Milk delivery at quota year (april to march)										Change 2005/06 vs. 2004/05		Change 2004/05 vs. 1983/84	
	1983/84	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06				
Reg. Bezirk	1 000 t										1 000 t	%	1 000 t	%
Schleswig-Holst.	2,701	2,264	2,251	2,294	2,279	2,256	2,280	2,363	2,355	2,293	-62.5	-2.7	-408.4	-15.1
Hamburg	15	8	8	7	8	7	7	7	7	7	-0.7	-10.1	-8.1	-55.5
Niedersachsen	6,012	4,989	4,941	5,080	5,006	4,975	4,956	5,062	5,084	5,063	-21.3	-0.4	-949.3	-15.8
RB Braunschweig	433	263	256	254	241	239	228	229	221	217	-4.1	-1.9	-215.5	-49.8
Hannover	761	545	530	530	515	512	499	494	499	491	-9.0	-1.8	-270.7	-35.6
Lüneburg	1,861	1,660	1,661	1,733	1,745	1,731	1,727	1,777	1,779	1,771	-7.8	-0.4	-89.3	-4.8
Weser-Ems	2,957	2,521	2,494	2,563	2,506	2,492	2,502	2,563	2,584	2,584	-0.4	0.0	-373.8	-12.6
Bremen	23	22	21	22	21	21	21	22	22	21	-1.0	-4.5	-2.7	-11.4
Nordrhein-Westf.	3,278	2,616	2,592	2,635	2,590	2,609	2,611	2,640	2,651	2,629	-22.1	-0.8	-649.3	-19.8
RB Düsseldorf	631	572	573	588	587	596	601	612	621	621	-0.4	-0.1	-9.8	-1.6
Köln	692	542	544	554	544	543	550	553	555	546	-8.5	-1.5	-145.5	-21.0
Münster	824	658	649	663	660	666	664	674	672	666	-6.5	-1.0	-158.6	-19.2
Detmold	657	450	435	432	411	415	411	407	407	405	-1.7	-0.4	-251.6	-38.3
Arnsberg	474	394	389	397	387	389	386	394	396	391	-5.1	-1.3	-83.7	-17.7
Hessen	1,291	976	978	991	972	979	966	974	980	984	4.8	0.5	-306.5	-23.7
RB Darmstadt	325	217	218	215	207	207	208	203	204	204	-0.2	-0.1	-121.6	-37.4
Giessen	357	273	273	275	268	268	258	262	264	264	0.6	0.2	-92.2	-25.9
Kassel	609	486	487	500	497	505	499	509	512	516	4.4	0.9	-92.7	-15.2
Rheinland-Pfalz	939	752	754	762	740	754	761	767	765	757	-8.4	-1.1	-181.9	-19.4
RB Koblenz	347	245	244	241	230	230	231	234	231	228	-3.3	-1.4	-119.5	-34.4
Trier	438	405	409	421	413	426	432	437	438	434	-4.0	-0.9	-4.0	-0.9
Rheinh.-Pfalz	154	102	101	100	97	97	97	96	97	96	-1.1	-1.1	-58.4	-37.9
Baden-Württemb.	2,568	2,162	2,139	2,109	2,138	2,138	2,128	2,133	2,119	2,097	-22.0	-1.0	-471.0	-18.3
RB Stuttgart	769	627	616	614	619	615	607	606	612	611	-1.0	-0.2	-157.9	-20.5
Karlsruhe	201	155	154	150	148	148	145	144	148	149	0.9	0.6	-52.6	-26.1
Freiburg	421	368	369	360	365	368	376	377	368	364	-4.3	-1.2	-56.7	-13.5
Tübingen	1,178	1,012	1,000	985	1,007	1,007	999	1,006	992	974	-17.6	-1.8	-203.7	-17.3
Bayern	8,539	7,024	6,971	6,943	7,028	7,012	6,976	7,084	7,004	6,996	-8.3	-0.1	-1,543.5	-18.1
RB Oberbayern	2,518	2,044	2,039	2,035	2,059	2,049	2,042	2,089	2,043	2,026	-17.2	-0.8	-491.8	-19.5
Niederbayern	1,115	894	884	884	887	882	884	894	885	883	-1.9	-0.2	-231.9	-20.8
Oberpfalz	977	872	864	867	873	864	869	880	871	877	6.2	0.7	-99.4	-10.2
Oberfranken	641	532	529	532	534	530	527	534	532	541	8.4	1.6	-100.1	-15.6
Mittelfranken	792	661	655	652	662	661	650	659	657	668	10.6	1.6	-124.1	-15.7
Unterfranken	319	222	222	220	224	227	222	224	223	228	5.1	2.3	-91.4	-28.6
Schwaben	2,178	1,800	1,778	1,752	1,791	1,799	1,781	1,805	1,792	1,773	-19.5	-1.1	-404.7	-18.6
Saarland	106	87	85	87	86	86	87	88	88	86	-2.3	-2.6	-20.1	-19.0
Berlin (West)	0	0	0	0	0	0	0	0	0	0	0.0	10.7	0.1	44.7
Brandenb./Berlin	1,381	1,283	1,291	1,300	1,302	1,297	1,289	1,313	1,304	1,328	24.4	1.9	-52.7	-3.8
Meckl.-Vorpom.	1,579	1,351	1,324	1,300	1,314	1,305	1,296	1,346	1,352	1,354	1.7	0.1	-225.3	-14.3
Sachsen	1,726	1,444	1,454	1,453	1,491	1,473	1,494	1,532	1,519	1,552	33.3	2.2	-173.6	-10.1
Sachsen-Anhalt	1,216	1,038	1,059	1,059	1,049	1,034	1,016	1,025	1,028	1,055	27.0	2.6	-161.4	-13.3
Thüringen	1,027	924	929	919	925	909	902	912	905	930	24.8	2.7	-96.7	-9.4
Old Laender	25,472	20,899	20,740	20,930	20,869	20,838	20,792	21,141	21,075	20,932	-143.7	-0.7	-4,540.4	-17.8
New Laender	6,929	6,040	6,057	6,031	6,080	6,018	5,997	6,128	6,108	6,219	111.2	1.8	-709.7	-10.2
Germany	32,401	26,938	26,798	26,961	26,949	26,855	26,789	27,270	27,183	27,151	-32.5	-0.1	-5,250.1	-16.2

Source: ZMP, BMELV.

At present, milk production is mainly concentrated (> 5,000 kg/ha UAA) in western parts of North Rhine-Westphalia and Lower Saxony as well as in Schleswig-Holstein, in South Germany in the pre-alpine areas and along the Czech border. Milk production density is below 2,000 kg/ha UAA in an area stretching from South-West of Baden-Württemberg over the Saarland and Rhineland-Palatinate to the new federal states (Figure 2-2).

Figure 2-2: Regional allocation of milk production in Germany (t per ha UAA)



Source: Isermeyer et al. (2006)-

The development and regional spread of producer milk prices is shown in Table 2-4. The milk price level is above average in Bavaria and Baden-Wurttemberg as well as Rhineland-Palatinate, while it is below average in the new federal states. Prices between dairies vary significantly, depending on product line, competition and milk composition.

Table 2-4: Producer prices for milk (at natural fat content)

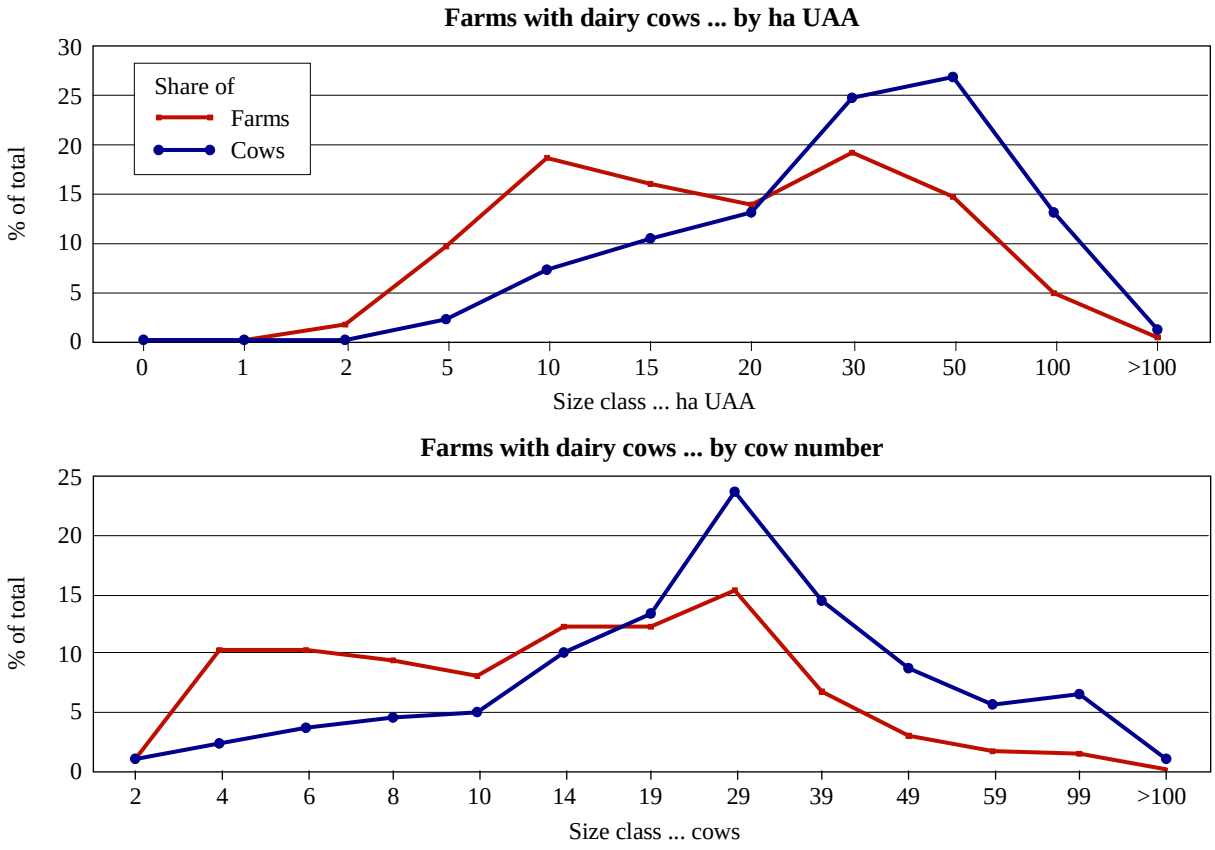
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
									EUR/100 kg							
Baden-Wuerttb.	33.53	31.81	32.18	31.23	30.65	30.75	30.52	30.50	31.71	30.23	31.36	34.68	32.23	30.72	30.05	29.24
Bayern	32.84	32.16	32.90	31.58	30.49	30.37	30.03	30.26	31.73	30.80	32.30	35.63	32.82	31.15	30.33	30.18
Brandenburg	-	27.62	29.31	29.18	28.86	29.51	29.27	29.70	30.67	29.34	31.57	34.06	31.02	29.73	29.35	28.74
Hessen	33.94	32.18	32.17	31.36	29.92	29.62	29.87	29.45	30.76	30.09	30.99	34.27	32.49	29.96	29.33	28.84
Meckl.-Vorpom.	-	26.01	29.19	29.32	28.96	29.21	29.41	29.98	31.78	29.69	31.93	34.25	30.40	28.90	28.61	28.00
Niedersachsen	32.76	31.84	32.57	31.52	30.14	30.26	29.42	29.51	30.96	29.22	30.72	33.50	29.45	28.29	28.49	28.08
Nordrh.-Westf.	34.75	33.39	32.81	32.29	30.49	29.78	29.21	28.97	30.89	30.09	31.19	33.70	31.42	29.93	29.19	28.52
Rheinland-Pfalz	35.58	33.49	32.28	33.34	30.91	31.32	31.09	31.24	32.94	31.53	32.11	34.93	34.78	32.58	31.52	29.78
Sachsen	-	27.41	30.32	29.65	29.44	29.58	30.03	30.23	31.29	30.59	31.76	34.56	31.09	29.71	29.24	28.64
Sachsen-Anhalt	-	27.37	30.38	30.43	29.57	29.99	29.74	29.57	30.39	28.95	30.67	33.89	30.63	29.06	28.85	28.02
Schlesw.-Holst.	31.20	30.33	30.60	31.00	30.05	30.46	29.70	29.72	31.51	29.44	31.82	33.92	29.58	29.23	28.85	27.75
Thueringen	-	28.71	29.39	29.69	28.96	29.09	29.15	29.46	30.96	29.94	31.05	33.95	31.97	29.23	29.36	28.33
Old Laender	33.13	32.06	32.43	31.63	30.37	30.33	29.84	29.91	31.45	30.16	31.60	34.54	31.66	30.18	29.68	29.15
New Laender	-	27.37	29.74	29.62	29.17	29.49	29.56	29.85	31.08	29.73	31.52	34.23	30.89	29.42	29.02	28.33
Germany	**-**	**31.18**	**31.97**	**31.29**	**30.17**	**30.18**	**29.79**	**29.90**	**31.37**	**30.09**	**31.58**	**35.54**	**31.50**	**30.02**	**29.54**	**28.97**

Source: ZMP, BMELV.

2.1.2 Scale and intensity of production

In 1985 milk production was concentrated in small farms (Figure 2-3). One third of farms had less than 10 cows. 50 % of farms kept 10 to 30 cows (50 % of total cow stock). Approximately 1,000 farms had more than 100 cows. Part of these rather large farms closed milk production due to high labour costs of milkers. Figure 2-3 highlights that dairy farms were comparably small with respect to land, too, as only 20 % of them had more than 50 ha UAA.

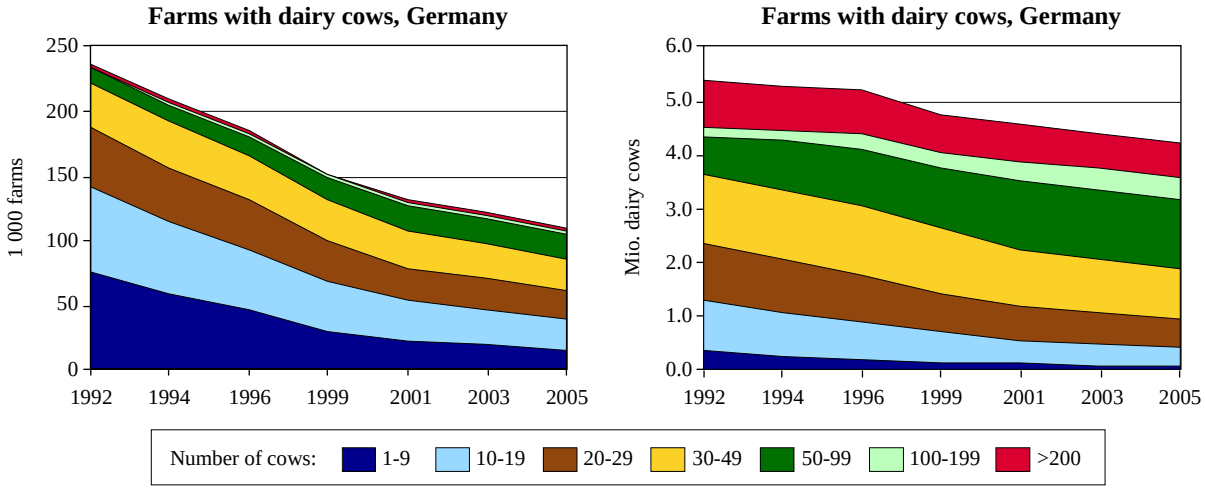
Figure 2-3: Structure of dairy farms in Germany, 1985



Source: Statistisches Bundesamt, Land- und Forstwirtschaft, Fischerei, Fachserie 3, Reihe 4, Viehbestand und tierische Erzeugung (1986).

Figure 2-4 shows the structural development since 1992. The number of farms with less than 20 cows decreased from 140,000 in 1992 to 30,000 in 2005. Only the number of farms with more than 50 cows increased. In size class 20 to 30 cows the number of farms decreased from 2.3 million to 1 million. Today, the main part of cows is kept in farms with 50 to 100 cows.

Figure 2-4: Development of size structure of dairy farms in Germany



Source: Statistisches Bundesamt, Land- und Forstwirtschaft, Fischerei, Fachserie 3, Reihe 4, Viehbestand und tierische Erzeugung.

The development of farm size in the old and New Laender is shown in Table 2-5. The average herd size (2005) is 38.4 cows, with significant differences between the old (32.3 cows) and the new federal states (176.4 cows). Average herd sizes are lowest in Baden-Wurttemberg, Bavaria and Hesse, with 25 to 31 cows. In the old federal states, the largest average herd size is observed in Schleswig-Holstein (56 cows).

Table 2-5: Development of the number of dairy cows per dairy farm

Land	1993	1994	1995	2000	2001	2002	2003	2004	2005	2006
	Number of cows per milk producer									
Baden-Wuerttemberg	14.1	.	15.7	21.7	.	24.0	24.3	.	26.7	.
Bayern	16.1	.	17.5	23.1	.	23.5	23.4	.	24.6	.
Brandenburg	141.4	.	136.4	185.4	.	193.7	201.9	.	210.1	.
Hessen	14.3	.	16.5	25.6	.	27.5	28.8	.	31.4	.
Mecklenburg-Vorpommern	133.2	.	141.3	163.9	.	175.3	178.3	.	199.7	.
Niedersachsen	24.5	.	28.4	39.1	.	41.5	43.4	.	46.4	.
Nordrhein-Westfalen	20.6	.	23.4	32.5	.	35.5	37.3	.	40.7	.
Rheinland-Pfalz	20.9	.	24.5	35.9	.	38.4	38.9	.	41.1	.
Saarland	22.3	.	21.4	41.2	.	41.8	43.9	.	47.4	.
Sachsen	82.7	.	86.6	133.1	.	135.9	138.1	.	144.4	.
Sachsen-Anhalt	137.3	.	131.7	157.5	.	156.3	167.3	.	182.0	.
Schleswig-Holstein	38.7	.	43.0	56.6	.	55.0	57.1	.	58.7	.
Thueringen	83.5	.	83.5	146.1	.	142.8	149.4	.	165.6	.
Old Laender	19.1	20.1	21.1	28.4	29.0	29.5	31.3	31.9	32.3	32.5
New Laender	106.7	115.1	112.7	155.0	156.4	158.0	165.1	169.9	176.4	179.1
Germany	**24.0**	**25.2**	**26.7**	**33.7**	**34.3**	**35.1**	**36.0**	**37.8**	**38.4**	**38.5**

Source: ZMP, BMELV.

Milk yields increased by 100 to 200 kg annually and reach approximately 7,200 in the north and 7,900 kg in the new federal states. In the South, where breeds combing milk and beef production dominate, milk yields are lower by approximately 1,000 kg (Table 2-6). In addition to breeds, farm structure will also influence yield levels, as generally, yields in larger dairy farms are higher, as management is more professional.

Schleswig-Holstein and Niedersachsen had the highest dairy yields in 1991, which may explain why they have had the slowest growing milk yields (they still had the highest dairy yields in the old Laender in 2005).

The reasons for the observed changes in production shares are complex, and there is no single and statistically proven model explaining the observations or linking them to factors of competitiveness. From our point of view, important factors are:

– dairy farms in Schleswig-Holstein and Niedersachsen are comparatively large
– parts of Schleswig-Holstein and Niedersachsen are comparatively productive permanent grassland areas with few agricultural alternatives and often with few possibilities for off-farm activities.

Table 2-6: Development of milk yields

Land	1991	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Baden-Wuerttemberg	4,285	4,843	4,926	5,063	4,976	5,077	5,267	5,408	5,518	5,783	5,809	5,868
Bayern	4,488	4,876	4,928	4,925	5,017	5,204	5,403	5,439	5,438	5,792	5,814	5,930
Brandenburg/Berlin (Ost)	4,337	5,381	5,576	5,851	6,170	6,521	6,914	7,123	7,338	7,582	7,602	7,977
Hessen	5,294	5,532	5,712	5,749	5,941	5,991	5,786	6,405	6,364	6,402	6,473	6,651
Mecklenburg-Vorpommern	4,275	5,371	5,722	6,012	6,317	6,555	7,002	7,142	7,258	7,505	7,625	7,749
Niedersachsen	5,966	6,277	6,291	6,308	6,320	6,502	6,537	6,752	6,703	6,903	6,967	7,233
Nordrhein-Westfalen	5,340	5,955	6,030	5,991	6,109	6,462	6,406	6,603	6,891	6,948	7,055	7,188
Rheinland-Pfalz	4,612	5,373	5,573	5,537	5,603	5,767	5,869	5,957	5,968	6,240	6,282	6,531
Saarland	4,878	5,233	5,447	5,299	5,392	5,541	5,748	5,828	6,162	6,293	6,422	6,431
Sachsen	4,464	5,649	5,593	5,831	6,176	6,532	7,104	7,215	7,387	7,682	7,652	8,017
Sachsen-Anhalt	4,042	5,883	5,921	6,257	6,821	6,902	7,065	7,195	7,284	7,466	7,574	7,912
Schleswig-Holstein	5,505	5,688	5,709	5,697	5,878	6,066	6,209	6,338	6,450	6,744	6,727	6,827
Thueringen	4,435	5,343	5,613	5,789	6,224	6,411	6,854	7,062	7,151	7,370	7,493	7,818
Berlin (West), Bremen, Hamburg	5,523							6,818	7,022	7,371	7,313	7,074
Old Laender	4,942	5,413	5,473	5,483	5,565	5,746	5,912	5,991	6,033	6,284	6,344	6,547
New Laender	4,320	5,482	5,674	5,938	6,317	6,577	6,995	7,149	7,295	7,547	7,598	7,902
Germany	**4,807**	**5,427**	**5,513**	**5,575**	**5,717**	**5,909**	**6,112**	**6,213**	**6,272**	**6,537**	**6,585**	**6,761**

Source: ZMP, BMELV.

Feed areas used for milk production cannot be determined exactly on a national level. The following trends are derived from EU-FADN for specialised dairy farms (TF 41) between 1992 and 2004 (Table 2-7[2]):

– The number of dairy cows per farm increased from 26.9 to 42.5, and milk yield increased from 5,300 to 6,720 kg/cow

– The use of land (UAA) increased from 32.6 to 53 hectares with a constant share of area being used for fodder crops (80%).

– Cattle stocking rates were slightly reduced from 1.88 to 1.77 LU/hectare forage area, while those of dairy cows were almost constant at 1 LU/ha forage area.

Due to declining beef production and cow numbers (related to increasing milk yields and the quota) there is a tendency towards grassland extensification in regions with low cattle densities, which is partly promoted by agri-environmental policy measures. Extensive grassland is often used for grazing of suckler cows, especially in the new federal states, but also in the old federal states, where suckler cows are kept mainly in small part time farms.

Table 2-7: Development of specialised dairy farms (TF 41) in Germany

	FADN code		1992	1994	1996	1998	2000	2002	2004
Economic size	SE005	ESU	32.3	35.4	43.7	43.0	46.1	69.0	70.3
Total labour input	SE010	AWU	1.54	1.51	1.73	1.67	1.66	1.74	1.74
Total Utilised Agricult. Area	SE025	ha	32.59	33.68	39.95	39.81	41.84	51.38	53.12
Rented U.A.A.	SE030	ha	14.73	15.85	21.74	21.45	22.96	31.34	32.77
Forage crops	SE071	ha	26.24	26.22	30.84	31.27	34.72	39.27	40.98
Set aside	SE073	ha	0.00	0.73	1.04	0.70	0.75	1.42	1.33
Total livestock units	SE080	LU	51.5	52.6	62.0	61.9	67.0	77.3	77.7
Dairy cows	SE085	LU	26.86	27.53	32.69	32.22	36.86	41.83	42.53
Other cattle	SE090	LU	22.83	22.68	26.25	26.40	28.60	32.90	32.32
Sheep and goats	SE095	LU	0.09	0.04	0.04	0.07	0.11	0.16	0.15
Pigs	SE100	LU	1.50	2.07	2.61	2.84	1.22	2.24	2.49
Poultry	SE105	LU	0.15	0.19	0.24	0.25	0.13	0.09	0.12
Stocking density	SE120	LU/ha	1.88	1.85	1.85	1.83	1.84	1.84	1.77
Forage	SE120D	ha	26.40	27.01	31.91	32.07	35.58	40.77	42.39
Grazing livestock	SE120N	LU	49.68	49.99	58.93	58.67	65.53	74.83	74.96
Milk yield	SE125	kg/cow	5.312	5.519	5.665	5.974	6.307	6.474	6.720
Dairy cows	SE125D	cow	27	28	33	32	37	42	43
Dairy products	SE125N	kg	142.692	151.930	185.207	192.490	232.484	270.831	285.848

Source: EU FADN public domain (http://ec.europa.eu/agriculture/rica).

Trends in scale and intensity of production differ regionally. Generally, in the north there has been a stronger trend towards specialisation and intensification, whereas in the South,

[2] Structural indicators of specialized dairy farms at Laender level are given in Annex 3.

this trend has been somewhat weaker due to the focus on the Fleckvieh breed, which combines milk and beef production.

Trends for Bavaria as a southern region are described in more detail in Chapter 3.

2.1.3 Degree of specialisation

There has been a continued specialisation in dairy farming, with approximately 80% of dairy cows being kept in beef and dairy farms. Specialisation took place especially in the north and in the new federal states, whereas the combination of milk and meat production is of greater importance in the South of Germany. There is also a regional specialization with an increasing shift of milk production towards grassland regions.

2.1.4 Types of production

At present, three different breeds dominate milk production in Germany, with clear regional differences (DORFNER, 2007): Holstein-Friesian (58.5 % of all cows), dominating in the north and east, Fleckvieh (25.2 % of all cows), dominating in Bavaria and Baden-Wuerttemberg, and Brown cattle (6.1 % of all cows), kept in the alpine region. Approximately 26 % of cows are kept in tie-stalls mainly in smaller farms), while 64 % of cows are kept in free stall barns with cubicle boxes (dominating in farms with more than 40 cows). During the last decade, there was a significant change with respect to stable types and grazing systems (Table 2-8), with more free stall barns and reduced grazing. The reduced grazing is a consequence of the often unfavourable geographical distributions of the farm's land (farms/stalls in village, with many parcels spread at considerable distances), as well as the trend towards high yields, as the continuous demand for high energy feed can only be realised in year round stable feeding.

Table 2-8: Change in stable types and grazing systems in dairy production

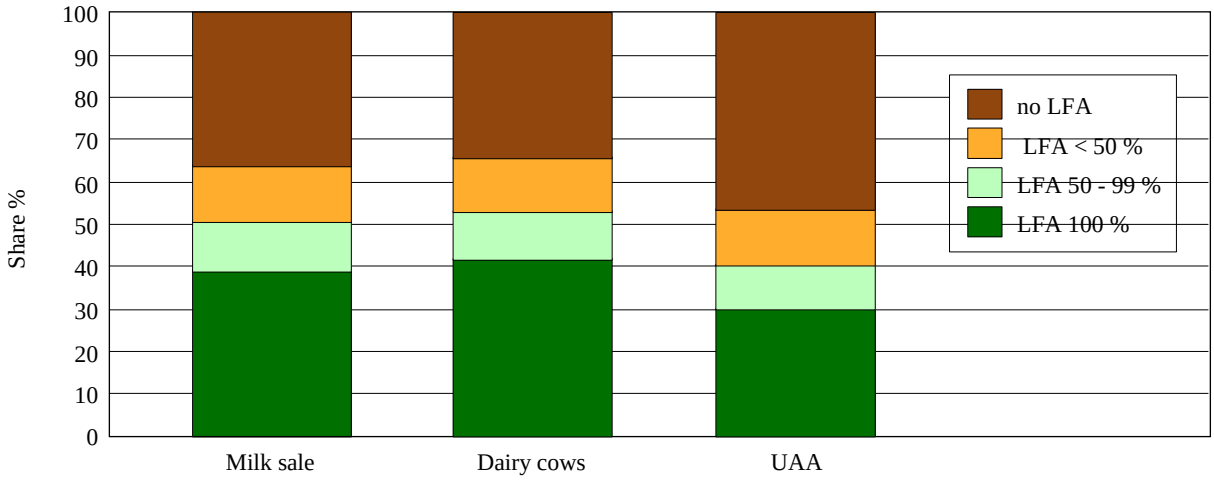
	1990	1999
Stable		
tie-stalls, solid dung	31	13
tie-stalls, liquid manure	37	33
free stall barns with cubicle boxes, solid dung	2	3
free stall barns with cubicle boxes, liquid manure	29	51
Grazing		
Year-round stable holding	42	62
Semidiurnal on grazing	24	8
Number of grazing days/year	151	139

Source: UBA (2002).

2.1.5 Less Favoured Areas

Based on an extrapolation of German FADN, in 2004/05, approximately 40 % of milk production was located in areas which are 100 % LFA, vs. 35 % located in non-LFA areas (Figure 2-5).

Figure 2-5: LFA milk production, cow stock and UAA (2004/05)



Source: BMELF, Testbetriebe (2004/05).

As LFA is mainly concentrated in the south and centre of Germany, there might be a higher share of Fleckvieh breeds and below average milk yields. Further, a higher share of grass silage and hay in roughage feed is applied. While in LFA regions combined milk and beef production is still important, the non-LFA regions are more specialized in milk production.

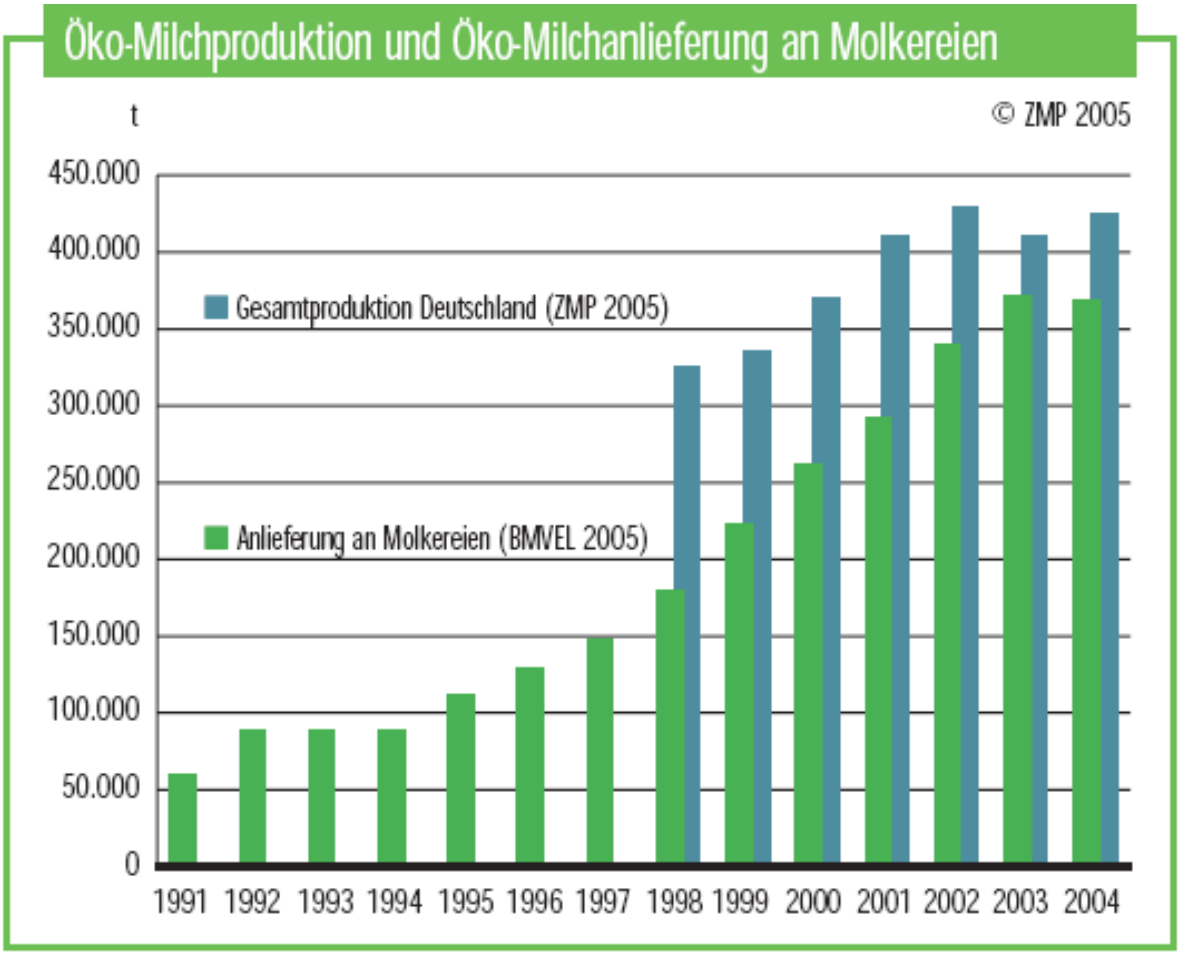
Steep hillsides are increasingly used for grazing of young cattle and sheep. While milk production has considerably been reduced in the alpine regions, the alpine pastures are increasingly used for young livestock, a trend strengthened by two aspects: Firstly, dairy farms in the valleys frequently have problems with the upper limits for livestock densities, which can be alleviated by temporarily moving young cattle to alpine pastures. Secondly, the grazing of Alpine pastures is supported by agri-environmental programmes (i.e. KULAP).

2.1.6 Organic milk production

Organic milk production has significantly increased from 330,000 t in 1998 to 460,000 t in 2006 (i.e. 1.6 % of total milk production). In 2004, of the approximately 425,000 tons of organic milk produced, 368,000 t were delivered to dairies as organic milk (Figure 2-6).

Most of the organic milk delivered to dairies is processed for fresh milk, butter and cheese, with a much smaller share being used for yoghurt or cream cheese (BLE, 2005). The market for organic dairy products continues growing strongly, with an increase in turnover of 38 % in 2006 (ZMP, 2007).

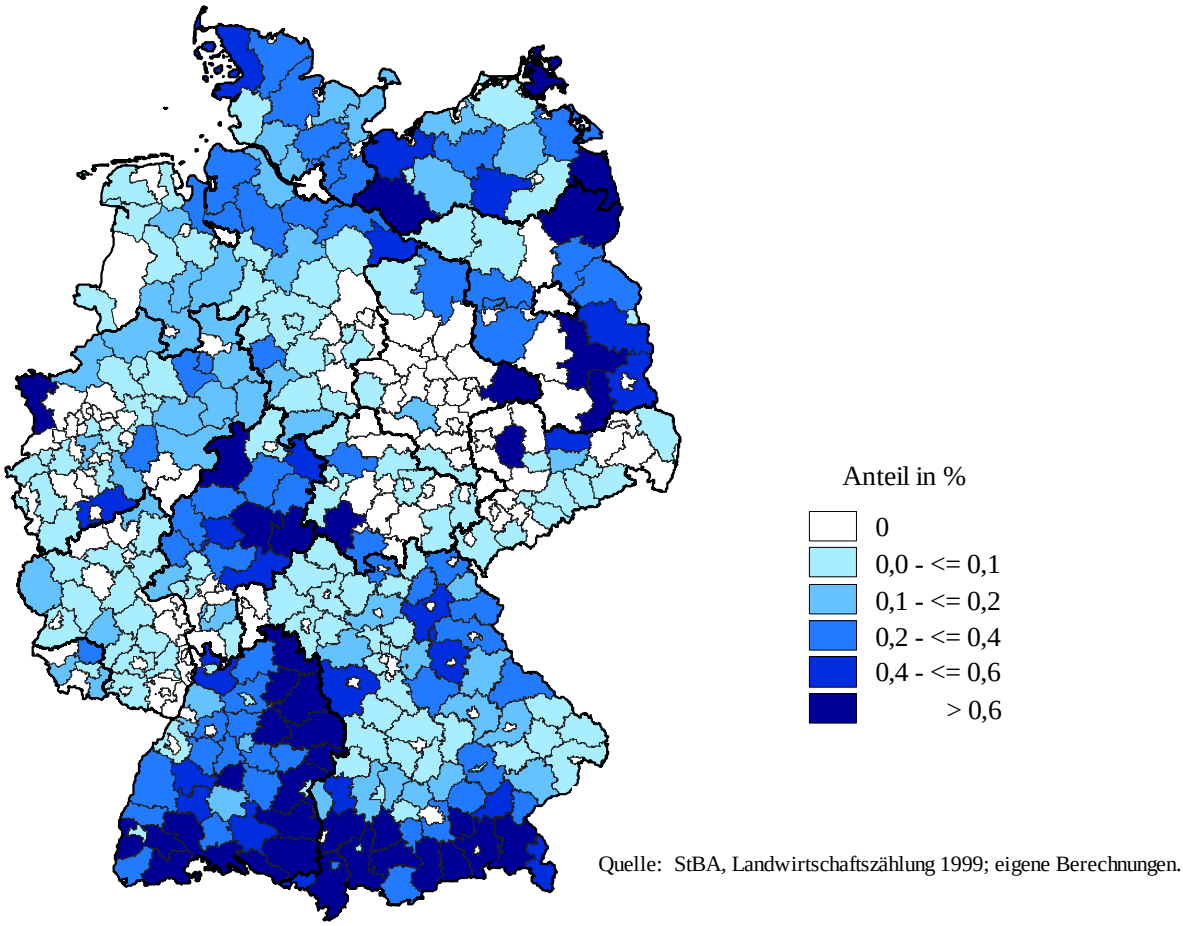
Figure 2-6: Production of organic milk and delivery to dairies



Source: BLE (2005).

Organic dairy production is concentrated in the South (Baden-Württemberg, southern Bavaria), Hesse, Mecklenburg-Vorpommern, and parts of Schleswig-Holstein and Brandenburg (Figure 2-7).

Figure 2-7: Regional share of organic dairy cows as a percentage of total number of organic dairy cows in Germany (%), 1999



Source: Osterburg and Zander (2004).

The majority of organic farms are members of organic associations, which in some cases have stricter standards than EC 2092/91, especially with respect to feeding (some of the organic associations require 100% organic feed), import of manure and the requirement that the whole farm has to be converted.

2.1.7 Labelled products (Regional Certificate of Origin)

Labelled milk products do not yet play a major role in Germany. Only four cheese types are certificated as PDO (Allgäuer Bergkäse, Allgäuer Emmentaler, Altenburger Ziegenkäse, Odenwälder Frühstückskäse). For the production of Bergkäse, feeding of cows with silage is forbidden.

2.2 Milk quota

2.2.1 National distribution of milk quota

1984/85, Germany was allocated milk quota totalling 23.487 million t Table 2-9). After reductions of quota, the quota dropped to 21.465 million tons in 1988/89. In the course of reunification a guaranteed total quantity of 6.804 million t was allocated to the farmers in the new federal states, which was reduced to a quota of 6.245 million t by 1994/95. The national quota (A) amounted to 27.769 million t in 2003/04. In addition 95,600 tons are available for direct sales.

Table 2-9: National milk quota

Quota year	1,000 ton
1984/85	23,487
1985/86	23,423
1986/87	23,423
1987/88	22,050
1988/89	21,465
1989/90	21,834
1990/91	21,834
1991/92	27,549
1992/93	27,549
1993/94	27,765
1994/95	27,765
1995/96	27,765
1996/97	27,765
1997/98	27,768
1998/99	27,767
1999/00	27,768
2000/01	27,769
2001/02	27,769
2002/03	27,769
2003/04	27,769
2004/05	27,769
2005/06	27,769

Data 1984/85 to 1990/91 refering to old Laender.
Source: Based on Deutscher Raiffeisenverban (1995) and BMELV.

There is no information on regional distributions of quota. Indirectly, the regional distribution of milk quota can be inferred for 2004 based on the applications for milk premiums (see Table 2-10). According to this data, 21.339 million t of quota was eligible for the dairy premium in farms in the old Laender, compared to 6.184 million t of quota in the new Laender.

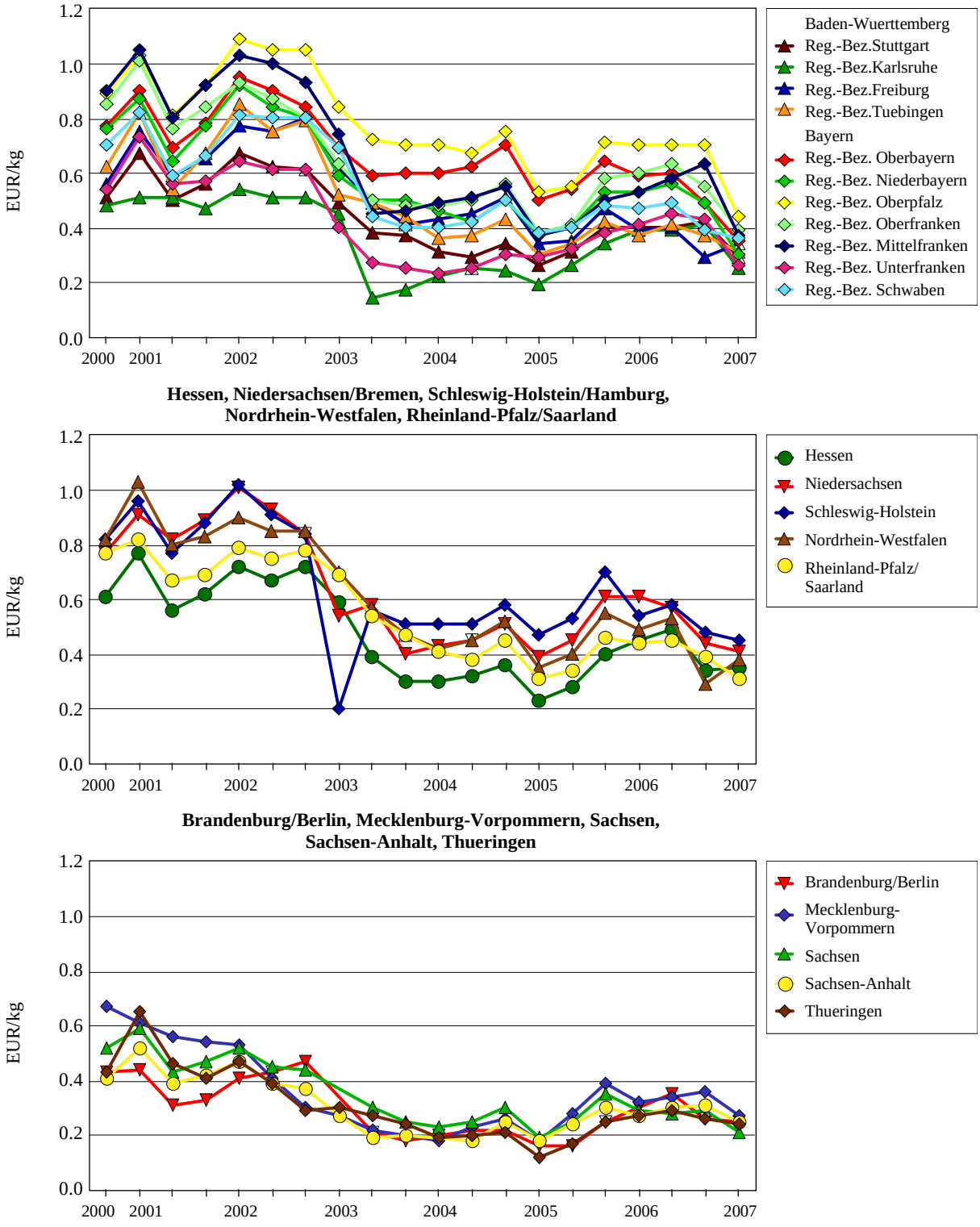
Table 2-10: Quota derived from the implementation of dairy premia

Land	Reference quota as base for milk premia (kg)
Baden-Wuerttemberg	2,172,380,565
Bayern	7,126,358,817
Berlin	46,338,673
Brandenburg	1,299,929,731
Bremen	21,415,002
Hamburg	7,339,542
Hessen	1,025,565,547
Mecklenburg-Vorpommern	1,334,509,888
Niedersachsen	5,099,332,638
Nordrhein-Westfalen	2,685,299,427
Rheinland-Pfalz	781,390,324
Saarland	90,721,460
Sachsen	1,530,437,435
Sachsen-Anhalt	1,072,835,655
Schleswig-Holstein	2,282,967,352
Thueringen	947,136,450
Old Laender	21,339,109,347
New Laender	6,184,849,159
Germany	**27,523,958,506**

Source: BMELV (2005).

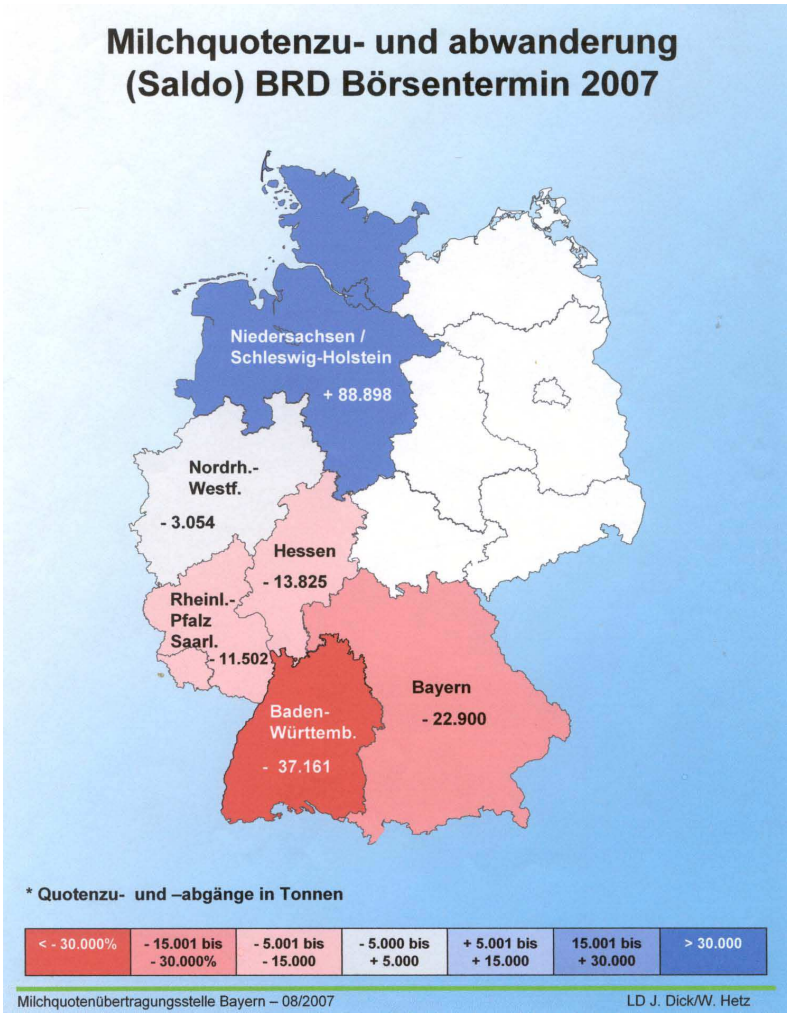
Statistical information about quota prices is available only since the introduction of the milk quota auctions (Figure 2-8) Price levels and development are substantially determined by the ratio of demand and supply. In the year before the introduction of the auction more than twice the normal yearly quota transfer was realised. In the first auctions there was a high surplus in demand which led to a rise in prices and a high price level: 70 to 90 cent/kg in the West or 30 to 55 cent in the East. 2006, the quota price was 50 cents/kg in the West and 25 cents in the East. The introduction of the milk premium led to a rise in prices in October 2004, because together with quota milk premium rights were purchased. In 2006/07 a surplus of supply arose in some regions, resulting in a fall of quota prices by about 15 cents in the West and 5 cents in the East. The price level is highest in Bavaria, although there are strong disparities in price between the assignment regions. The situation in Baden-Wurttemberg is comparable. The low price level in the new federal states is influenced by lower profit margins due to the costs incurred for hired workers, as well as high shares of rented land, and the fact that banks often limit the lending of loans for quota purchase to approximately 25 cents/kg. Following the reduction of trading zones from 21 to 2, quota can be traded within all Lander in the West and East, respectively, since July 2007. Under the new system, there was a net trade of quota from the south towards the north (Figure 2-9).

Figure 2-8: Development of regional quota prices



Source: http://www.bauernverband.de

Figure 2-9: Quota net trade between regions, quota auction 2007



2.2.2 Relationship between milk quota and milk production

The developments of milk delivery, milk quota, quota balance and super levy are shown in Table 2-11. The milk quota was not completely used in the New Lander until 1997. Using the possibilities of balancing - first on level of the dairies, and secondly on the Federal level - the volume of over-deliveries subject to superlevy could be reduced. Farms in the region of Lüneburg (Lower Saxony) are reported to have been able to deliver up to 50 % over their own quota without having to pay any superlevy. This phenomenon has been coined ‘Saldierungstourismus’ (‘balancing tourism’) by experts.

Table 2-11: Over/under production of milk by quota years 1995/96-2006/07

Quota year	Farm		Saldation on		Overdelivery of national quota
	oversupply	undersupply	Dairies level	National level (incl. 100 000 t quota reserve)	
1995/96	1,248,500	1,130,000	610,000	620,000	18,500
1996/97	1,440,000	950,000	630,000	420,000	390,000
1997/98	940,000	540,000	500,000	110,000	330,000
1998/99	620,000	350,000	310,000	120,000	190,000
1999/00	760,000	500,000	360,000	220,000	180,000
2000/01	1,040,000	710,000	620,000	170,000	250,000
2001/02	1,060,000	820,000	640,000	270,000	150,000
2002/03	1,200,000	1,190,000	910,000	380,000	(-)90 000
2003/04	1,470,000	1,000,000	890,000	210,000	370,000
2004/05	1,400,000	890,000	830,000	160,000	410,000
2005/06	1,130,000	820,000	790,000	130,000	210,000
2006/07	1,170,000	1,070,000	810,000	347,200	12,800

Source: BMELV (2007).

3 Main characteristics of the dairy sector in Bavaria

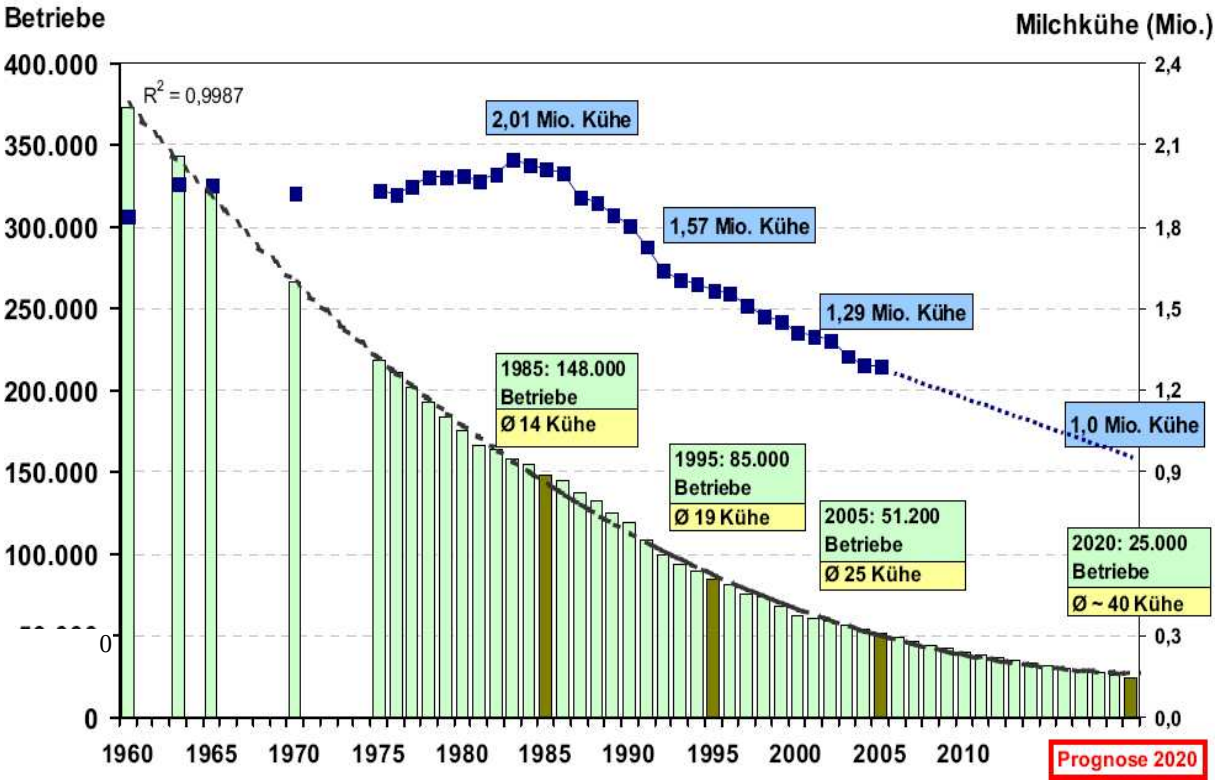
3.1 Milk production

Milk production and processing play an important role in Bavaria. Milk production contributes to 36 % of the agricultural production value. 2 million t of milk from other regions are processed in Bavaria. Almost half of milk is processed to cheese and partially exported.

3.1.1 Main structural developments in the dairy sector in Bavaria from 1988

The number of dairy cows decreased strongly, from 2 million cows in 1983 to 1.2 million in 2006 (Figure 3-1).

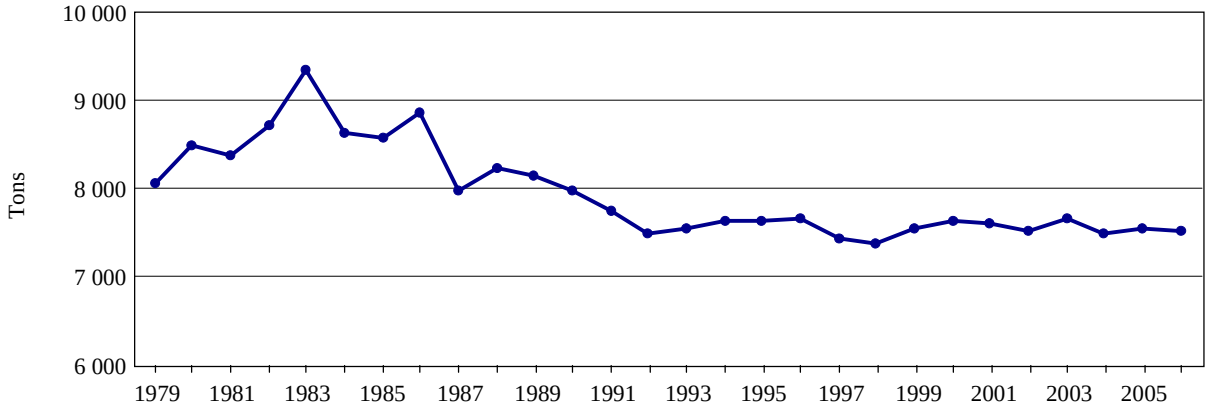
Figure 3-1: Development of dairy farm structure and projection of structural change in dairy farms in Bavaria



Source: Dorfner (2007).

In the years before the introduction of the milk quota scheme, the production increased from 8 million t in 1979 to 9.4 million t in 1983 (Figure 3-2). Quota was allocated to farmers on the basis of milk production in 1983, minus 7 %. As a result of further quota cuts and various quota closure programmes, milk production was down to 7.5 million t in 1992, and has more or less stabilised at this level.

Figure 3-2: Development of milk production in Bavaria



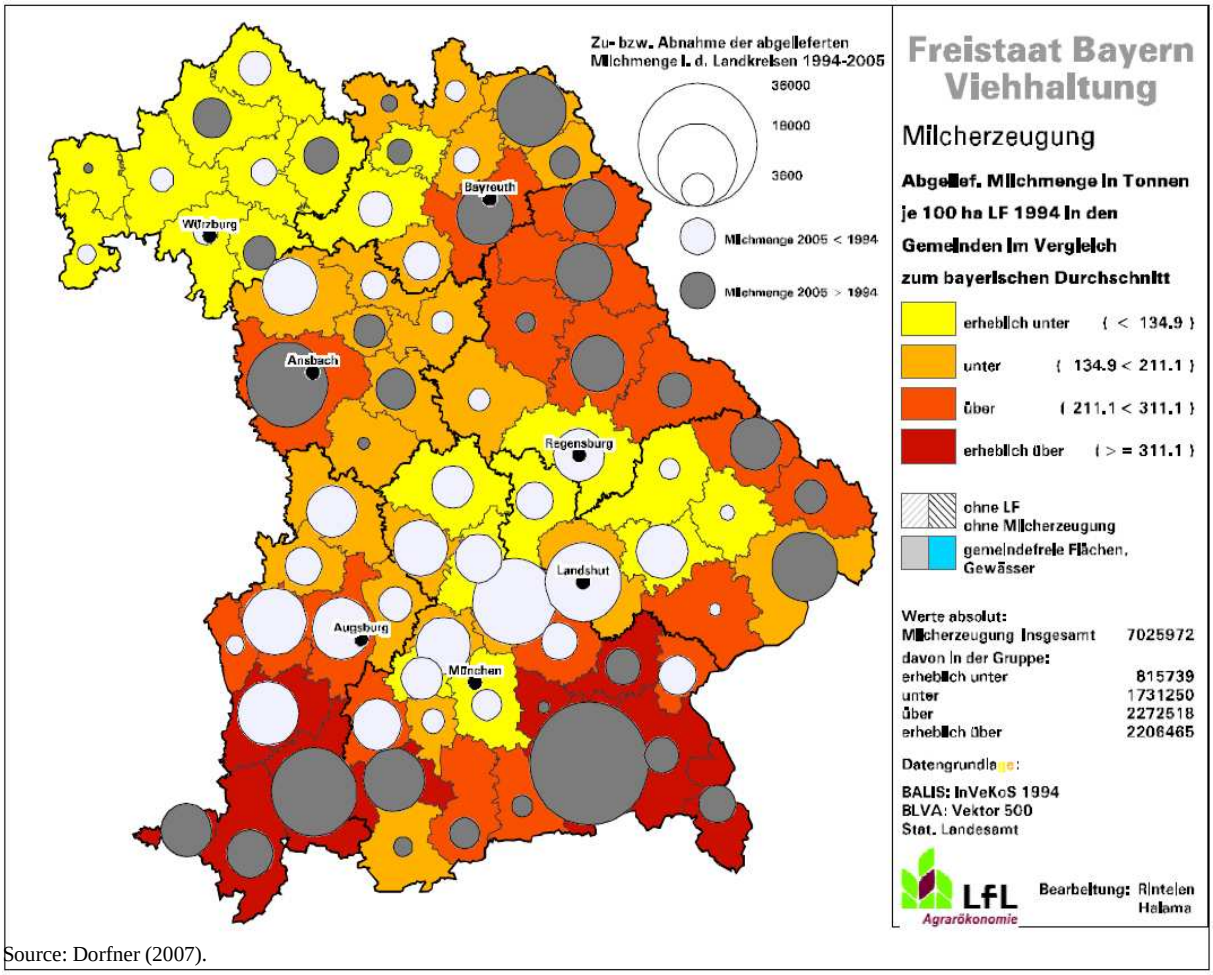
Source: Own calculation based on cow number and milk yields.

In comparison to 1983/84, milk production has declined by 28 % in Niederbayern and by 21 % in Unterfranken by 2005 (see Table 2-3, Chapter 2.1). These reductions of production have mostly taken place within the first years of the introduction of the milk quota system. There has been a significant reallocation of production, especially within the trading regions. Figure 3-3 provides an overview of changes in production from 1994 to 2005. Milk production became increasingly concentrated in regions with a high share of permanent grassland, especially in Upper Palatinate, the Bavarian Forest, Allgäu and the prealpine region as well as in middle Franken. Reasons are lower feeding costs and a high share of milk from fodder, the lack of other agricultural production alternatives, the potential for a combination with income from agri-tourism, and a lack in off-farm employment opportunities in these regions. Reductions of dairy farming have primarily taken place in arable regions. The former feed areas were used for arable crops and farms specialised in pig production and bull fattening. Milk production has declined considerably in the arable regions in Niederbayern. A concentration on few locations has taken place within Upper Franconia.

During the last years, a strong competition for land developed in regions where biogas is produced from maize silage, which is also reflected in land prices and may lead to further relocations. This situation was especially dramatic in 2007, when returns for silage maize on the open filed reached € 2,000/hectare (approximately twice as high as compared to the

previous year). Under these conditions, the production of maize for biogas is economically much more favourable than its use as feed for milk production.

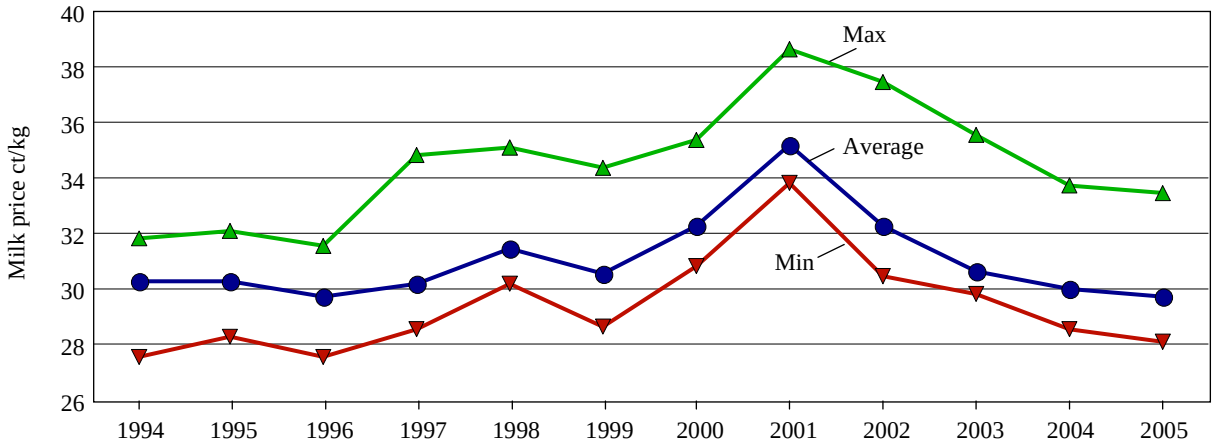
Figure 3-3: Main production centres of milk and development of production from 1994 to 2005



Source: Dorfner (2007).

Milk prices in Bavaria are approximately 1 cent/kg above the federal average. The milk price was on a level of 30 to 33 cent/kg between 1990 and 2003 (Figure 3-4). Due to milk shortages in times of the BSE crisis it temporarily rose to 35 cents/kg in 2001. In the wake of the reductions of the intervention prices in the course of the milk market reform the price has gone down to 28 to 29 cents in 2006. The milk price has risen drastically since the middle of 2007 and reached 40 to 43 cents in 2008, with 48 to 50 cent/kg for milk produced by organic farms. Milk prices vary up to 3 cents/kg between the dairies, with higher prices generally paid by dairies which primarily produce cheese.

Figure 3-4: Farm gate milk prices in Bavaria



Source: ZMP (2004): Milchpreisvergleich 2004. Materialien zur Marktberichterstattung, Bd. 54.

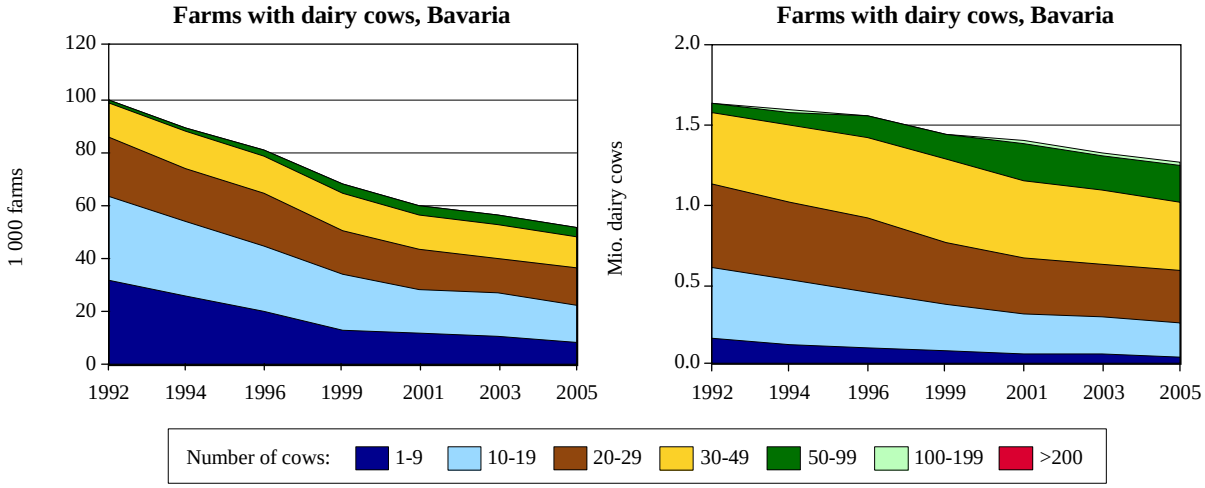
Feed areas used for milk production cannot be determined exactly on a regional level. Some evaluations based on EU-FADN for specialized dairy farms (TF 41) are highlighted in chapter 3.1.2.

Fallow of land due to the abandonment of milk production has not been a problem in Bavaria. Attractive grassland support from the agri-environmental programmes (KULAP) as well as the obligations for minimum maintenance under Cross Compliance have been preventing land abandonment. Steep hillsides are increasingly used for grazing of young cattle and sheep. While milk production has considerably been reduced in the alpine regions, the alpine pastures are increasingly used for young livestock, a trend strengthened by two aspects: Firstly, dairy farms in the valleys frequently have problems with the upper limits for livestock densities, which can be alleviated by temporarily moving young cattle to alpine pastures. Secondly, the grazing of Alpine pastures is supported by agri-environmental programmes (KULAP).

3.1.2 Scale of production and intensity of production in Bavaria

Milk production in Bavaria is characterised by small farm structure. In 1980 52 % of the milk cattle holders had up to 9 cows (23 % of cows). Their share declined to 14.5 % (4% of cows) in 2005 (Figure 3-5). The share of farms with 10 to 19 cows has halved and that with 20 to 29 cows has remained constant. The share of farms with 30 to 49 cows increased by one third. In 2005 only 20.5 % of the cows belonged to the class with more than 50 cows. In comparison with other federal states the share of farms with more than 100 cows (0.2 % of farms; 1.3 % of cows) is very small. Milk production is still realised in large parts by small and medium sized farms.

Figure 3-5: Development of size structure of dairy farms in Bavaria



Source: Statistisches Bundesamt, Land- und Forstwirtschaft, Fischerei, Fachserie 3, Reihe 4, Viehbestand und tierische Erzeugung.

The average number of dairy cows per holding increased from 16 in 1995 to 25 in 2005 (Table 2-5, chapter 2.1.2), and is considerably lower than the federal average (34 cows). Dairy yields increased from 4,488 kg in 1991 to 5,930 kg per cow in 2005 (Table 2-6, chapter 2.1.2).

60 % of dairy farms are full-time farms, keeping 80 % of the cows. The share of part-time farms with 40 % of farms and 20 % of cows has been relatively constant. In intensive dairy regions (Allgäu, pre-alpine, Oberbayern) cattle livestock density is approximately 2 LU/hectare. Some farms have problems in meeting the stocking rate limits of the Nitrate Directive. Management options for these farms include renting of land, raising young cattle on the Alps, selling male calves for fattening, and increasing arable fodder production.

Cattle livestock density is lower in Franken because of lower rainfall, summer dryness and lower grassland yields. Due to decoupling of direct payments and increasing area competition with biogas utilisation of silage maize, the use of grass in dairy feed will increase. Grass allows higher milk yield from basic feedstuff, however there is a tendency of instable feeding based on fresh grass or grass silage. Grazing of dairy cows is declining due to higher labour input. The fragmentation of fields in the South does not allow grazing; also the pollution of roads with excrements proves to be an obstacle in tourist areas. Grazing is of importance for young cattle and suckler cow keeping.

About one third of the silage maize is used for feeding of dairy cattle. Due to the natural local conditions in the main production areas, grass represents the main feed basis. Obviously, preferential treatment of maize under the coupled premium scheme (higher reference

yields for maize and therefore higher premium levels per ha of maize) might have favoured milk production in arable areas. However, this advantage became almost neutralised by the strong rise of rental prices for arable land.

Feed areas used for milk production cannot be determined exactly on a regional level. Evaluations based on EU-FADN for specialized dairy farms (TF 41) show the following trend between 1989 and 2004 (Table 3-1):

– Increase of average cow stock of 20 to 30 cows and an increase of average milk yield of 4.6 to 6.2 t/cow
– Increase of UAA from 20.2 to 35.5 hectares; increase in feed area by 11 hectares and increase of the feed area share from 71 to 78 %
– Reduction in cattle stocking rates from 2.16 to 1.83 LU/hectare forage area (1.24 to 1.08 for dairy cows).

Table 3-1: Development of specialised dairy farms (TF 41) in Bavaria

	FADN code		1989	1992	1994	1996	1998	2000	2002	2004
Economic size	SE005	ESU	23.5	25.0	26.7	30.3	30.7	32.6	46.8	47.2
Total labour input	SE010	AWU	1.54	1.50	1.44	1.53	1.54	1.52	1.53	1.53
Total Utilised Agricult. Area	SE025	ha	23.23	25.24	25.37	27.33	28.55	29.37	34.47	35.52
Rented U.A.A.	SE030	ha	7.58	9.32	9.93	11.15	12.13	12.60	16.83	18.25
Forage crops	SE071	ha	16.52	19.02	17.86	19.99	21.39	23.92	26.13	27.21
Set aside	SE073	ha	0.00	0.00	0.63	0.63	0.43	0.44	0.75	0.74
Total livestock units	SE080	LU	37.7	40.7	39.5	43.2	44.2	47.3	52.3	52.2
Dairy cows	SE085	LU	20.41	22.07	21.56	23.85	24.06	27.65	29.97	30.08
Other cattle	SE090	LU	15.32	17.38	16.37	17.37	18.05	19.08	21.23	21.05
Sheep and goats	SE095	LU	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.04
Pigs	SE100	LU	1.72	1.02	1.42	1.71	1.83	0.42	0.89	0.86
Poultry	SE105	LU	0.23	0.13	0.15	0.17	0.13	0.06	0.07	0.09
Stocking density per ha forage	SE120									
...Grazing livestock		LU/ha	2.16	2.06	2.05	2.00	1.93	1.92	1.90	1.83
...Dairy cows		LU/ha	1.24	1.15	1.16	1.16	1.10	1.13	1.11	1.08
Forage	SE120D	ha	16.52	19.11	18.51	20.63	21.82	24.38	26.91	27.96
Grazing livestock	SE120N	LU	35.71	39.41	37.88	41.17	42.11	46.72	51.17	51.14
Milk yield	SE125	kg/cow	4,572	4,886	5,134	5,211	5,548	5,870	5,960	6190
Dairy cows	SE125D	cow	20	22	22	24	24	28	30	30
Dairy products	SE125N	kg	93,330	107,826	110,678	124,299	133,503	162,319	178,632	186,192

Source: EU FADN public domain (http://ec.europa.eu/agriculture/rica).

3.1.3 Degree of specialisation in Bavaria

Based on farm classification there were 40,000 specialized milk cattle holders, keeping 83 % of dairy cows and producing 83 % of milk in 2005 (Table 3-2). These numbers include, however, a considerable share of part and full time farms with less than 50 cows.

Farms with Holstein Frisian cows are generally more specialized towards milk than farms with Fleckvieh.

Table 3-2: Dairy farms in Bavaria

		Bavaria	Farms with dairy		Non- specialised		Specialised dairy farms	
		Total	Total	Share of total farms	Total	Share of total farms	Total	Share of total farms
Farms		131,784	51,185	*39*	10,912	*8*	40,273	*31*
UAA	ha	3,250,342	1,719,196	*53*	515,310	*16*	1,203,886	*37*
Grassland	ha	1,159,365	816,036	*70*	128,470	*11*	687,566	*59*
Arable land	ha	2,081,306	901,645	*43*	385,881	*19*	515,764	*25*
Cereals	ha	1,087,928	439,810	*40*	211,881	*19*	227,929	*21*
Arable fodder	ha	413,092	320,308	*78*	81,967	*20*	238,341	*58*
Silage maize	ha	301,219	236,956	*79*	62,914	*21*	174,042	*58*
Ray grass	ha	84,906	65,091	*77*	14,012	*17*	51,079	*60*
Set-aside	ha	147,329	60,559	*41*	32,096	*22*	28,463	*19*
Cattle total	Head	3,607,780	3,040,814	*84*	617,273	*17*	2,423,541	*67*
Dairy cows	Head	1,289,501	1,289,483	*100*	215,070	*17*	1,074,413	*83*
Calves	Head	563,431	455,116	*81*	98,776	*18*	356,340	*63*
Female cattle > 6 mo.	Head	1,179,605	1,060,411	*90*	195,583	*17*	864,828	*73*
Male cattle > 6 mo.	Head	488,335	220,425	*45*	98,642	*20*	121,783	*25*
Milk quota	1 000 kg	7,156,407,431	7,144,843,248	*100*	1,195,093,488	*17*	5,949,749,760	*83*

Source: Dorfner (2007), modified.

In comparison to other regions, small and middle sized farms in the Allgäu and the pre-alpine areas prove to be relatively competitive, due to income combination with tourism, off-farm income and combined beef and milk production (three quarters of the fattening bulls are raised in milk cattle farms). Specialized dairy farms (relative to dairying on non-specialized dairy farms) are more reliant on grass (0.5 ha per cattle vs. 0.2 ha per cattle on non- specialized dairy farms) and somewhat less on maize silage, and on average have significantly more quota (+35 %).

3.1.4 Types of production in Bavaria

About 60% of the milk cows are held within tie-stalls with pipe milking plants and summer stable feeding. Many of the tie-stalls are relatively new, as they were promoted by investment subsidies up to the nineties. These farms have 24 cows on average while farms with free-stalls (cubicle) have 47 cows on average. Approximately 25 % of farms have free-stalls (cubicle), keeping 45 % of all dairy cows.

Farms with cow free-stalls (cubicle) have larger dairy herds (on average 47 cows) than farms with tie-stalls. There also are race specific size differences: Farms with Fleckvieh (which combines milk and beef production) and Brown Swiss have 35 cows on average (milk control association) while farms with Holstein Frisians on average are larger by 10 cows. Farms with Holstein Frisians are more specialised in milk production, located in

Upper Franconia and use a higher share of maize silage as feed. Farms with Holstein Frisians have milk yields of 7,920 kg (2005), which is considerably higher than with Fleckvieh (6,580 kg) or Brown Swiss (6,800 kg) (Table 3-3).

With regard to the economic performance, dairy production from Holstein Frisians and Fleckvieh is almost balanced since at present the price for male calves is about 400 € for Fleckvieh (90 kg) and 100 € for Holstein Frisians (50 kg). Fleckvieh bull-calves are well suited for bull fattening, which is carried out primarily in combination with milk production.

Table 3-3: Dairy breeds and milk yields in Germany and Bavaria

	Germany (2004) Herdbuchrinder	Bavaria (2005) Cattle	Bavaria (2005) Cows with milk yield control		
	Share of animals (%)		Share of animals (%)	Milk yield kg/cow/year	Average size cow/farm
Fleckvieh	25.2	82.9	76.3	6,580	31
Holstein Frisian	58.5	4.2	8.6	7,920	41
Brown Swiss	6.1	7.9	14.4	6,802	31
Other	4.0 [1)]	5.0	0.7	4,200-5,800	20

1) Including beef cattle.

Source: Dorfner (2007).

The high share of Fleckvieh (83 % of farms) combining milk and beef production is characteristic for this region. The population of Holstein Frisian is only 5 %. Farms with Holstein Frisian show a larger cow stock on average, are specialized in milk, have higher milk yields, and have been growing faster than farms with Fleckvieh.

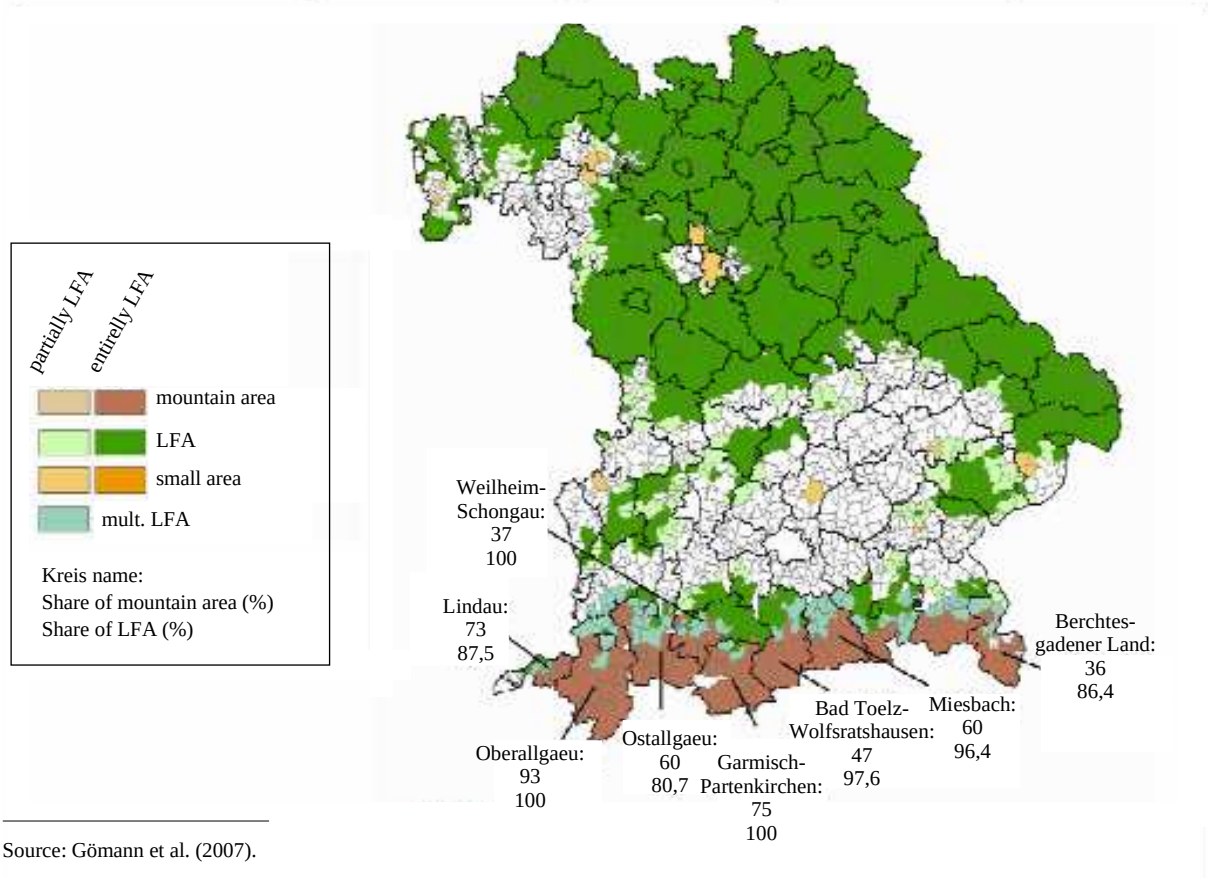
The dominance of the Fleckvieh breed is explained by tradition as well as by economic reasons:

– The joint production of beef is economically attractive because of good marketing opportunities for calves and meat to Italy.
– Fleckvieh has lower demands on management than feeding Holstein Frisian cows with milk yield of up to 10,000 kg.
– Cost calculations based on a sample of 300 farms show that the gross margins of Fleckvieh don’t deviate from those of Holstein Frisians.

3.1.5 Less Favoured Areas in Bavaria

Large parts of the north-eastern Bavaria as well as foothills of the Alps belong to LFA (Figure 3-6). From the total of 3.5 million hectares in Bavaria, 1.55 million receive compensatory allowances. 216,000 hectares belongs to mountain areas (8,700 farms).

Figure 3-6: Mountain areas and other LFA's in Bavaria



Source: Gömann et al. (2007).

The main part of milk production is located in LFAs. Especially in Upper Palatinate, Bavarian Forest and Middle Franken milk production is located in LFAs, while in Schwaben and Oberbayern, approximately 50 % of milk production is located in non-LFAs.

The quantification of milk production in mountain areas proves to be difficult. Based on regional statistics, 16 % of milk is produced in mountain areas (GÖMANN et al., 2007). However, in the Alps and Alpine foothills as well of the Bavarian Forest, only 2.5 % of milk is produced (RÖDER, TU Munich, personal communication). This also corresponds to statements of experts that milk density in the Alpine region is less than 1,000 kg/hectare UAA.

In the pre-alpine region milk production is carried out predominantly in combination with tourism (accommodation). A large number of small dairies exist, producing cheese and fresh milk products for local markets. There is a tendency towards part-time farming, as attractive off-farm employment opportunities in small and medium sized industry are available. Whereas part-time farming in many areas is seen as a first step towards abandonment of milk production, in this region, according to the experts interviewed, young people feel obliged to continue dairy farming (Annex 2).

Financial support from compensatory allowances and agri-environmental programmes contributes to a large portion of agricultural income. Extensive farms also profit from the increase of premiums resulting from the national implementation of the Single Farm Payment.

The conversion of permanent grassland to arable land was rather strongly limited by legal frameworks until 2004. With the 2003 CAP reform, an increase in the conversion of permanent grassland has been observed, as since 2005 sanctions are only applied if more than 8% of the total regional grassland is transformed into arable land.

3.1.6 Organic milk

In 2005, 4,832 organic farms (3.7 % of all farms) managed 4.4 % of the total agricultural area and kept 50,000 dairy cows (4 % of total dairy cows). Organic farms are mainly located in grassland regions in the South of Bavaria. There are several dairies in these regions specialized in processing of ‘organic’ milk. Milk prices were 3 to 4 cents/kg higher, respectively 5 to 7 cent/kg since summer 2007. In 2008, prices for organic milk reached almost 50 cents/kg. There is a continued tendency towards organic farming, though growth rates are much lower than in the nineties.

Problems for organic dairy farms may arise in 2010, when tie-stalls in organic farms will only be permitted in exceptional cases. Therefore, farms may need to invest into free-stalls (cubicle), which might involve significant growth to herd sizes of 50 dairy cows, and for part-time farms would mean a shift to full-time farming.

3.1.7 Labelled products (Regional Certificate of Origin)

Almost 50% of the milk processed in Bavarian dairies is for cheese (incl. soft cheese). The milk industry has been successful by product diversification and innovations and improving their market shares. Bigger as well as smaller dairies build up their marketing

strategies on brand names. Specialities of cheese are produced and commercialized regionally by smaller dairies (mainly in the Allgäu and Oberschwaben).

Only two cheese types are certificated as PDO (Allgäuer Bergkäse, Allgäuer Emmentaler). For the production of Bergkäse, feeding of cows with silage is forbidden.

3.2 Milk quota

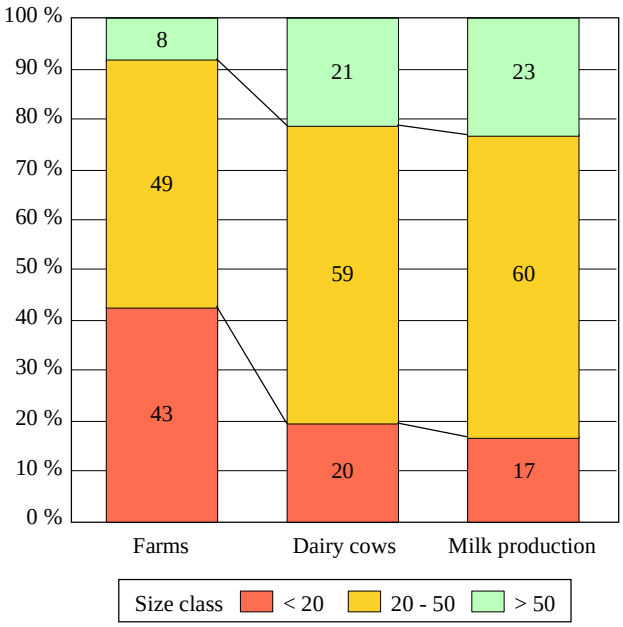
3.2.1 Distribution of milk quota in Bavaria

Information on the quantities of milk quota at the level of the Laender or trading zones is not available. Indirectly, the regional distribution of milk quota can be inferred for 2004 based on the applications for milk premiums. According to these data, 7.12 million tons of quota was eligible for the dairy premium in farms located in Bavaria. Based on calculations by DORFNER (2007) the quota is spread as follows (Figure 3-7):

– Farms with less than 20 cows: 17.1 %
– 20 to 50 cows: 59.7 %
– 51 to 99 cows: 21.8 %
– More than 100 cows: 1.4 %

Figure 3-7: Structure of milk production in Bavaria

Size class	Criteria	(abs.)	Share %
< 20	Farms	22 120	43.2
	Cows	259 112	20.1
	Quota (t)	1 224 702	17.1
20 - 50	Farms	24 908	48.7
	Cows	765 406	59.4
	Quota (t)	4 265 242	59.7
50 - 99	Farms	4 032	7.9
	Cows	249 297	19.3
	Quota (t)	1 556 471	21.8
> 100	Farms	125	0.2
	Cows	15 686	1.2
	Quota (t)	98 521	1.4
Bavaria	Farms	51 185	100.0
	Cows	1 289 501	100.0
	Quota (t)	7 144 936	100.0
Total	Cow/farm	25	
	Quota/farm	140	t
	Quota/cow	5 541	kg/cow

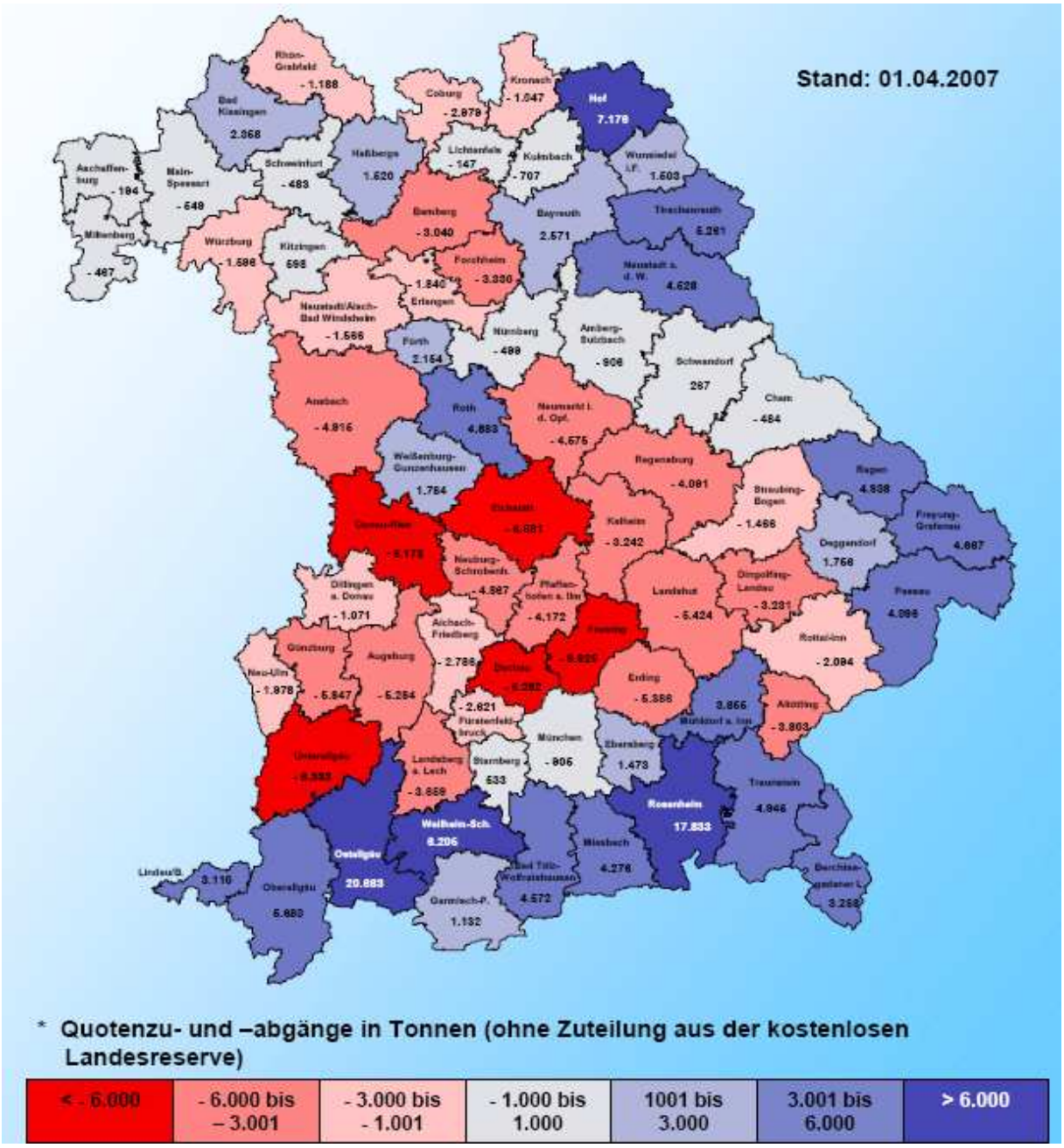


Source: Dorfner (2007).

11,500 t are in the possession of farms without dairy production. Due to regional restrictions for quota trade, quota transfer took place mainly within the trading regions. Interregional transfers have been confined to individual cases as described in chapter 4.

Figure 3-8 provides an overview of the reallocation of milk quota in Bavaria under quota auctions since 2000. Quota moved to the northeast and south, mainly from the north and centre of Bavaria.

Figure 3-8: Reallocation of milk quota in Bavaria under quota auctions since 2000



Source: Dick, LfL, Bayer. Landesanstalt für Landwirtschaft (2007).

Based on model calculations Thiele (2007) show that with reduction of trading zones (West/East, national), part of the quota will be reallocated in favour of the North. This tendency was already observed in the first auction with two regions (7/2007): 22,900 t of milk quota were transferred from Bavaria to other regions (Figure 2-9, Chapter 2.2.1). According to experts, this is also due to "bad speculations" of farmers in connection with the price corridor for eligible bids. As all demands exceeding the 40 % corridor are excluded, farmers orientate themselves at the equilibrium prices of previous auction. The following situation appeared:

– An equilibrium price of 42 cents/kg was determined for the region west (Figure 3-9)
– If farmers in low price regions (i.e. Unterfranken) bid 35 cents/kg, which is based on the price level of former auctions + 40 %, their offers were not successful.

Figure 3-10 shows the development of quota prices for the seven trade regions in Bavaria between 2000 and 2007. Quota prices were continuously the lowest in Unterfranken and highest in Upper Palatinate, where farmers do not have any attractive alternatives to milk production and few opportunities for off-farm employment. In many cases, quota is bought in small tranches matching the annual increase of milk yields. Quota transfer from small part time farms towards large full-time farms has been dominating (Geiger 2006). Reasons for quota sales are the phasing out of milk production, weak economic performance and farm exit.

Figure 3-9: Determination of equilibrium Price in Region West

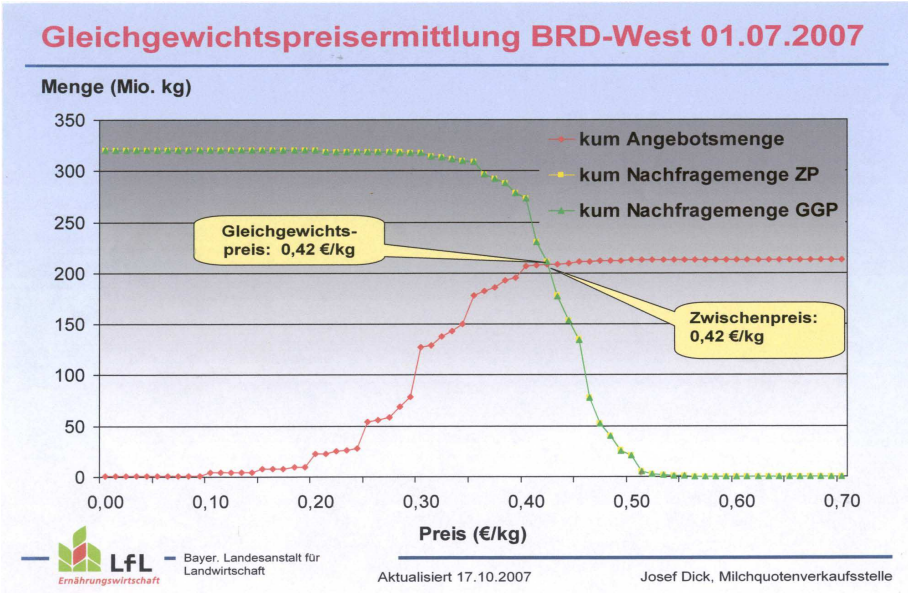
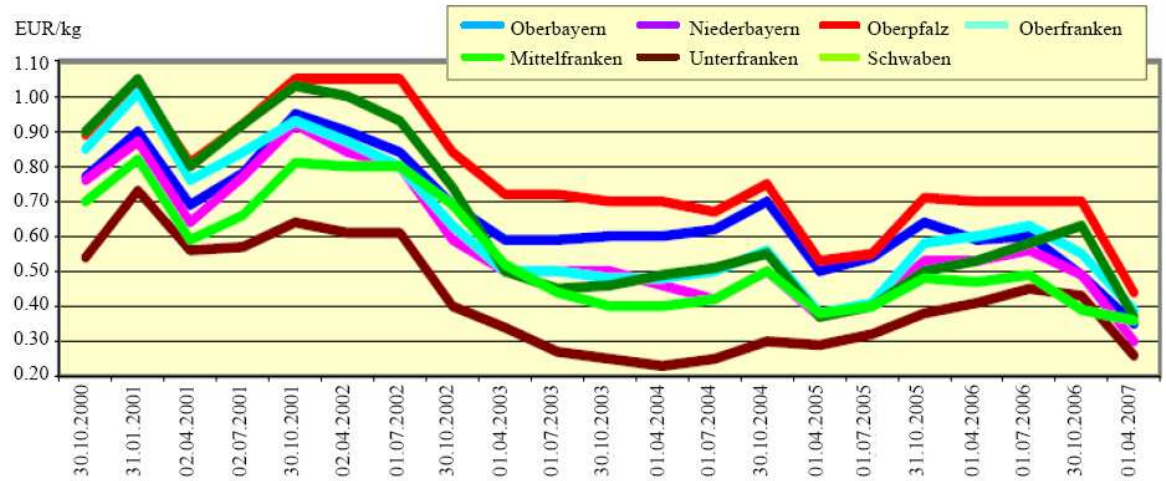


Figure 3-10: Development of equilibrium quota price in Bavaria



Source: Dick (2007).

Based on a survey of the Technical University of Munich (Hoffmann, Hebauer 2007) 70% of the questioned milk cattle holders in Bavaria reclaim a continuation of the milk quota scheme. High quota costs are hindering structural change. On the other hand they fear a devaluation of asset values. Returns from quota sales are often used for pension in retirement.

3.2.2 Relationship between milk quota and milk production in Bavaria

In most years, milk deliveries slightly exceeded milk quota, and resulting overproduction led to the payment of super levies. The limitations on quota trade and high quota prices hindered farm adjustments.

4 The Milk Quota System and its implementation in Germany since 1984

4.1 Main characteristics of the milk quota regime in Germany

In the milk quota year 1984/85 23,487 million t of quota were allocated to Germany. The first allocation of milk quota to farms was carried out based on formula A of the underlying EC Regulation (farm individual quota), based on the milk production in 1983[3] minus 7 %. The introduction of the milk quota system was accompanied with a number of unexpected problems. Due to the high share of rented land, 'old land lease contracts' from before 1984 were of special relevance for quota ownership and transfer. As a consequence of numerous claims for 'settlement of hardship cases', quota distributed to farmers exceeded by about 5.4 % the national milk quota. This excess quota (so-called 'Bauchladen') had to be reduced by different measures and public purchase of quota until 1992. The problem of excess quota is also seen as the reason that balancing of over- and undersupply was not allowed before 1993/94, and that temporary leasing was introduced with a delay of 3 years to EU legislation. Settlement of hardship cases and disputes concerning old lease contracts led to numerous legal disputes, which had to be decided also at the level of the Supreme Court. For juridical and administrative reasons, with few exceptions no preferential allocations of quota (e.g. for mountain areas, small farms) were realised.

With the reunification of Germany, 6.804 million t of quota were provided for the new Laender (based on the milk delivery in 1989 minus 12.5 %). For the new Laender, quota were allocated to farmers on a provisional basis until 2000. During this period, quota transfer was not allowed. The definite allocation was carried out on 01.04.2000.

Because of the prohibitive effect of the super levy, quota was in practice generally very effective at limiting production in Germany.

The quota regime in Germany has been subject to significant changes over the years. Generally, the adjustments to the schemes aimed at facilitating transfers and strengthening the position of active milk producers. During the first years of the quota scheme, the link of quota to land strongly impaired structural change in dairy farming, though structural change increased in periods when set-aside programmes were applied. Milk quota transfer was predominantly realised via renting of land. The increased flexibility of quota transfer from 1992 onwards, especially the transfer without land, was the basis for farm growth and the reallocation of production in the dairy sector; however it also led to an increase of quota prices. Due to structural change, quota transfer was considerable: Of the quota used

[3] In case of hardships, farmers could apply to use 1981 or 1982 as reference years.

by dairy farms in 2000, only 40 % were from milk quota originally allocated in 1984. 20 % were part of old land lease contracts, 30 % were rented after 1984 and about 10 % purchased. Since April 2000, permanent quota transfer is only possible via auctions at regional level, exceptions allowed in cases of transfers of whole farms or parts thereof, between direct relatives, and by inheritance: New contracts for temporary transfers are generally prohibited. Since July 2007, the number of trading zones has been reduced to two regions ('West' and 'East'). A single trading region for the whole Germany was planned for 2010 but finally not realised.

4.2 Permanent transfer of milk quota with land

Permanent transfer of milk quota with land is allowed under Article 17 of Council Regulation 1788/2003 (and previous legislation).

Until 1992, milk quota were strictly linked to land, and permanent transfer of quota was only allowed via purchase of the entire farm or parts of it, including inheritance or transfer to the farm successor. This link of quota to land still exists for land lease contracts dating from before 01.04.1984 ('old lease contracts'). However, to strengthen tenant's rights, quota did not have to be returned after the end of the old lease contracts for the first five hectares. Since 80 % of the old lease areas were smaller than five hectares, the predominant part of milk quota remained with the tenants. In practice, any return of quota was avoided via splitting of contracts and successively returning small areas (<5 ha), allowing a so-called 'thickening' of the milk quota on own land (or even on the stable area). Following a verdict of the Federal Administrative Court, this tenant protection was reduced later, and since 1992/93 half of milk quota (max. 2,500 kg/hectare) must be given back to the lessor for the area exceeding one hectare.

For the first years, the transferable quota was limited to 5,000 kg/ha (12,000 kg/ha from 1990). For quota transfers of more than 350,000 kg per farm, quota was reduced (siphoned to national reserve) by 30 %. Both of these restrictions were cancelled in 1993.

Transfer of quota with land contributed to mobility of milk production only to a very limited extent. The transfer of quota at the end of the 'old lease contracts' did not have any significant effects on mobility of milk production, as milk production already had relocated (quota followed production).

The strict link of quota to land proved to be a significant obstacle to farm growth. No quantitative data is available on the scale of permanent transfers of milk quota with land.

The strict link of quota to land prevented concentration of milk production and regional specialisation. No significant environmental impacts were identified.

4.3 Permanent transfer of milk quota without land

Permanent transfer of milk quota without land is allowed under Article 18 of Council Regulation 1788/2003 (and previous legislation).

The transfer of quota without land was introduced in September 1993 based on EU regulation, however these transfers were restricted to other producers within the same trading region (Laender; Regierungsbezirke in Lower Saxony[4], Bavaria and Baden-Wurttemberg). Quota transfer had to be notified by Laender authorities.

For the new Laender, quota trade was not allowed until 3/2000. Unused quota was withdrawn for the national reserve (for the whole of the New Laender); from there it was redistributed to resettled farmers ('Wiedereinrichter') or 'hardship cases' (320/360 t of quota per person for a maximum of 2 partners for partnership farms). This generous quota allocation free of charge attracted investors from the old Laender as well as from other countries (particularly The Netherlands). The definite assignment of the milk quota to the farms in the New Laender was carried out to the 01.04.2000.

Since April 2000, quota transfer is only possible via auctions at regional level, exceptions allowed in cases of transfers of whole farms or parts thereof, between direct relatives, and by inheritance. The auctions take place 3 times a year. In 2004, a price range for eligible bids was introduced, meaning that all offer and demand bids exceeding the intermediate equilibrium price by at least 40 % are eliminated. Since July 2007, the number of trading zones has been reduced to two regions ('West' and 'East'). Originally, a siphon of 5 % was applied to non-successful offers at the auction (with rates increasing up to 15 % for 3 repeatedly unsuccessful offers). This provision was dropped in the amendment of 6th Feb. 2002. Since 2000, a siphon is applied to expiring lease contracts if the quota is returned to the lessor and the lessor is no milk producer. In this case, 33 % of the quota is transferred to the national reserve.

As a general rule, German politics follow the principle that the milk quota system should not be overloaded with environmental or structural policy objectives, as these are better targeted by specific agri-environmental and structural policies which are implemented via numerous programmes in Germany.

[4] Lower Saxony cancelled the regional differentiation a few years later.

The possibility for granting compensation to farmers who voluntarily abandon all or part of their milk production (Article 18 1(a)) was used only during the first years of the milk quota system. Several 'milk pension actions' were carried out between 1984 and 1991, and 2.5 million t of quota were bought up in this time period, at a cost of 1.4 billion €. Quota thus allocated to the national reserve was mainly used to reduce the national excess quota, with a small share being used to support farms in particularly difficult situations. No related programmes have been implemented since 2000.

A preferential allocation of milk quota (from the national reserve) to smaller farms or in favour of mountain areas was carried out, e.g., in Baden Württemberg in the first years of the milk quota regime, However, the administrative implementation proved to be difficult, and this programme was soon given up because of administrative problems. According to the experts interviewed, key factors in the decisions not to use preferential allocations on a wider scale were a) problems in finding objective criteria which would withstand legal scrutiny as well as being acceptable to stakeholders, and b) the low confidence of dairy farmers in administrative allocations (resulting from bad experiences with hardship cases during the first years of the milk quota regime).

In the New Laender, initially priority was given to allocation of quota from the national reserves to resettled farmers ('Wiedereinrichter').

Within the current scheme of quota trade, quota from the national reserve is used to supply any excess demand arising at the 'equilibrium' price determined at the auctions. This allocation is carried out proportionally and free of charge to all successful demand bids. In addition, the Laender may distribute reference quantities to producers according to objective criteria. No Land has made use of this possibility, with the exception of North Rhine-Westphalia. Small amounts of quota are allocated in favour of farms which manage grassland used by wild geese and LFA's; the latter was abandoned in 2005.

4.3.1 Impact of permanent transfer of milk quota without land

While the original strict linkage of quota to land proved to be structure conserving, the quota transfer without land allowed the reallocation of quota towards the more favourable locations and farms within the same trading region (see above). Reallocations to other regions were realised only to a limited extent, namely from Hessen to Rhineland-Palatinate, North Rhine-Westphalia and Lower Saxony. The latter was possible via purchase of a whole farm located in other regions. In this case, milk production had to be maintained at the two locations for two years. Afterwards a definite transfer of milk quota and hence production to one of the farms was possible.

The transfer without land led to strong price increases for milk quota, particularly if milk quota was rented 'speculatively' at the end of the quota year with regard to the prevention of super levy. Purchase prices of 0.65 to 0.9 €/kg and rental prices of 7 to 10 cent/kg were realised. The price level was partly determined by the numerous milk pension programmes implemented before 1991, in which milk quota was bought for up to 0.78 €/kg. Interviewed farmers also complained about high prices and an intransparent market before the introduction of the auctions in 2000.

Milk quota required for continued growth (i.e. increase of milk yield at constant number of cows) is mainly purchased at the auctions. However, farms investing in significant capacity extension (mainly in the north), try to arrange the quota exchange outside the auctions, as a successful purchase bid at the auctions cannot be guaranteed due to the above mentioned price corridor. Typically, this is arranged by the take-over of other farms or the participation in co-operations. However, experiences in Bavaria have shown that approximately half of the milk cattle co-operations failed within five years.

Due to the relatively high price differences between regions, there is an incentive for farmers located in a region with high quota prices (e.g. Upper Palatinate) to sell their milk quota and restart milk production in a region with low quota prices. For quota sold in Upper Palatinate, two to three times the quota can be bought in the New Laender. This strategy has proved to be interesting especially for dairy farmers from the Netherlands, who could sell their quota for 2 €/kg and could then finance the purchase of ten times the volume of milk quota in the New Laender. The incentive was particularly high after reunification, because resettled farmers could get 320 to 360 t of milk quota per person free of charge. Financed by the sales of their original quota in high-priced regions, investments and size extension of dairy farming were realised, which would never have been possible in the West of Germany.

In the year before the introduction of the auction, the amount of quota transferred peaked, and reached approximately twice the level of quota normally transferred annually (Table 4-1). Since the introduction of quota auctions, 2.4 million t were transferred via the auctions, i.e. approximately 8.5 % of the national milk quota (Table 4-2). 6.6 million t (23.6 %) were transferred outside auctions. Thereof, 2.6 million t were transferred to farm successors and 1.2 million t were transferred as part of the building-up of a co-operation.

Table 4-1: Development of supply and demand of quota auctions in Bavaria

Term	Milk price EUR/kg	Supply (number)		Demand (number)		Amount (mio. kg)		
		Total	Successful	Total	Successful	Supply	Demand	Trade
30.10.2000	0.77	267	81 %	3,659	6 %	4.3	73.3	3.4
31.01.2001	0.88	497	99 %	1,962	22 %	6.5	28.1	6.2
02.04.2001	0.70	1,081	42 %	831	89 %	32.2	15.7	12.7
02.07.2001	0.77	1,077	99 %	3,422	32 %	21.9	68.0	21.3
30.10.2001	0.91	1,709	100 %	4,210	50 %	33.6	62.3	33.3
02.04.2002	0.89	1,173	98 %	4,917	35 %	32.0	91.2	31.4
01.07.2002	0.84	1,441	93 %	2,547	77 %	35.3	45.0	32.0
30.10.2002	0.69	2,395	44 %	2,228	84 %	54.3	30.6	19.4

Source: Dick (2007).

Table 4-2: Transfer of milk quota 2000-2007

	Direct transfer via								Total via auctions
	Farm	Inheritance	Inclusion into partnerships	Exit from partnerships	Prolongation of lease contracts	Fishing of lease contracts	Overtaking at the end of lease contract	Total	
Quota year	tons								
2000/2001	69,301	145,307	5,928	15,308	38,863	29,914	10,901	285,608	21,569
2001/2002	214,408	316,961	25,215	47,702	53,511	99,801	27,155	684,952	205,049
2002/2003	198,796	373,299	164,843	71,660	64,525	107,689	36,089	909,212	221,541
2003/2004	232,384	463,854	208,269	108,142	55,227	115,003	70,067	1,137,943	448,638
2004/2005	248,613	484,755	239,323	93,948	56,893	103,498	76,269	1,199,801	543,862
2005/2006	264,473	393,584	234,428	90,837	72,114	99,686	94,847	1,150,283	410,244
2006/2007	204,092	397,648	270,067	141,463	87,570	99,546	147,115	1,247,955	522,462

Source: BMELV (2007).

4.3.2 Farm management and environmental implications of permanent transfer of milk quota without land

The increasing specialisation of milk production in connection with an intensification of land management may lead to an increase of cattle stocking rates in individual cases, though this effect has not been observed on an aggregated level (see Table 2-5, Chapter 2.1.2). Intensification is effectively limited by other regulations. Until 2004, livestock density was in practice limited by the premium scheme for male cattle and suckler cows. In addition, the nitrate directive and the fertilizer ordinance set limits of 2 LU/hectare and 170 kg of organic N per hectare. For grassland, up to 210 kg of organic N per hectare may be allowed upon application, which is however seen as a considerable administrative obstacle in practice. Negative environmental effects of dairy farming are seen as an excep-

tion, as the spatial concentration of dairy farming is rather low. The existing rigid upper limits regarding organic nitrogen use per hectare are discussed very critical in Bavaria, since the natural yield potential in the foothills of the Alps (soil quality and precipitations) is high, and high nutrient supply can be balanced by corresponding N removal.

4.4 Temporary transfer of milk quota

Temporary transfer of milk quota is allowed under Article 16 of Council Regulation 1788/2003 (and previous legislation).

In Germany, a distinction is made between rent (long term leasing) and lease (short term leasing, i.e. temporary transfer for the current milk quota year).

The possibility of short-term quota leasing was introduced in 1990/91. Quota not used within a quota year could be leased out until the end of the quota year to other producers delivering milk to the same milk processor. Since 1993, temporary transfer of quota without land has been permitted, with no administrative constraints on contract duration. These transfers were restricted to other producers within the same trading region (21 trading zones were established, based on the Laender or Regierungsbezirke). Transfers took place based on bilateral contracts. Temporary transfers were disallowed in April 2000, although existing rental contacts retain their status, and exceptions exist in cases of transfers of whole farms or parts thereof and for transfers between direct relatives. Since 2001 short-term quota leasing is allowed again for hardship cases (animal epidemics, force majeure, provided that more than 25 % of farm's dairy stock dies or has to be killed); in this case the quota may be leased during the current and the following year.

4.4.1 Impact of temporary transfer of milk quota

The possibility of temporary transfers without land have increased quota mobility, as capital requirements are lower than for permanent transfers. This reduced capital requirement is seen as very important in view of the high capital requirements for growth in milk production (investments in stable capacities, milk extraction, feed and manure storage range from 3,000 to 5,000 € in the north and 5,000 to 7,000 €/stable place in the south. For permanent quota purchase, in addition, 2,000 to 5,000 €/stable place were necessary).

However, regional mobility was limited to within transfer zones, and the market was often intransparent.

In the year before the introduction of the auction, the amount of quota transferred peaked, and reached approximately twice the level of quota normally transferred annually (see Table 4-1). Of the quota used by dairy farms in 2000, 30 % were rented after 1984.

4.4.2 Farm management and environmental implications of rules for temporary transfer of milk quota

For many farms in Germany, a precondition to a profitable use of technical progress (free-stalls instead of tie-stalls; milking parlours instead of pipe milking systems; etc) often is the increase of herd sizes. Temporary transfers of quota facilitated growth due to the lower capital requirements compared to purchase. The attractiveness of transfer without land has increased over time, as due to increase of dairy yields, more cows can be fed from the same feeding area, and thus demand for quota is stronger than demand for land. The higher mobility of quota increased the incentive to increase dairy yields at the expense of replacement rates (at times, in the new Laender dairy yields increased by 300-500 kg per year, with a replacement rate of 40%).

4.4.3 Temporary redistribution of unused milk quota

The following options for balancing existed from 1993 to 2000 (in hierarchical order)

– within dairies
– within the new Laender
– on a national level.

From 04/2000 to 03/2006, balancing was possible firstly within dairies, and secondly on a national level. Since 2006/07 the balancing at dairies' level is limited to 10 % of the milk quota (HOFFMANN, 2007)

Table 2-11 (Chapter 2.2.2) shows the quota / production balance for the years 1995/96 to 2006/07. In 2006/07, over- and underproduction at farm level amounted to 1.17 million t. This figure was reduced by 0.8 million t following balancing within dairies, and by 0.347 million t through national balancing. Finally an overproduction of 12,800 t. remained, for which a super levy has to be paid. As the D-quota (direct marketing) was never fully used, it was never subject to the super levy.

Until 2000, farmers with excess production used temporary quota lease to avoid paying the super levy. Following the abolishment of temporary quota lease in 2000, farmers with excess production, especially in the north, searched for dairies with underproduction, and

then signed new contracts with these dairies, exploiting the possibilities for unrestricted balancing within dairies allowed until 2006. Farms in the region of e.g. Lüneburg (Lower Saxony) are reported to have been able to deliver up to 50 % over their own quota without having to pay any super levy. This phenomenon has been coined 'Saldierungstourismus' ('balancing tourism') by experts. This was seen as leading to considerable injustices, as there were farmers in other regions who frequently had to pay the super levy even for small volumes of excess production, and from 2006/07 on, balancing at dairies level is restricted to 10 % of oversupply of individual farms.

Some farmers exploited the rules for balancing to circumvent the limitations and costs for quota purchase. However, as this is limited to single cases, the envirionmental impacts are seen as negligible.

4.5 National Reserve

During the first year of the milk quota regime, the national reserve was almost exclusively used to reduce the national excess quota. Since 1990, the national reserve includes approximately 100,000 t of quota purchased during former milk pension schemes, which have been used for national balancing to reduce the super levy. Since 1993, the volume of quota siphoned into the national was very low, totalling just 5,800 t in 1993/94 and 1995/96 (DEUTSCHER RAIFFEISENVERBAND, 1995).

A preferential allocation of milk quota (from the national reserve) to smaller farms or in favour of mountain areas was carried out in Baden Württemberg, in the first years of the milk quota regime. However, the administrative implementation proved to be difficult, and this programme was soon given up because of administrative problems. According to the experts interviewed, key factors in the decisions not to use preferential allocations on a wider scale were a) problems in finding objective criteria which would withstand legal scrutiny as well as being acceptable to stakeholders, and b) the low confidence of dairy farmers in administrative allocations (resulting from bad experiences with hardship cases during the first years of the milk quota regime).

In the New Laender, initially priority was given to allocation of quota from the national reserves to resettled farmers ('Wiedereinrichter').

Within the current scheme of quota trade, quota from the national reserve is used to supply any excess demand arising at the 'equilibrium' price determined at the auctions. Remaining quota of the 'Laender' reserve is allocated proportionally and free of charge to all successful demand bids. In addition, the Laender may distribute reference quantities to producers according to objective criteria. No Land has made use of this possibility, with

the exception of North Rhine-Westphalia. Small amounts of quota are allocated in favour of farms which manage grassland used by wild geese and LFA's; the latter option was abandoned in 2005.

4.5.1 Siphon

Retaining part of transfers is allowed under Article 19 of Council Regulation 1788/2003 (and previous legislation).

In case of transfers within the early retirement scheme, 30% of quota was retained for the national reserve. Until 1991, 30 % of quota was retained for quota transfer exceeding 350,000 kg per farm. Until 1993, quota was also siphoned into the national reserve when part of farms were transferred (until 1989/90: any quantity exceeding 5.000 kg/hectare; until 1993 any quantity exceeding 12.000 kg/hectare; until 1989/90: 20 % of the transferred quantity; 80 % for quantities exceeding 300,000 kg).

Originally, a siphon of 5 % was applied to non-successful offers at the auction (with rates increasing up to 15 % for 3 repeatedly unsuccessful offers). This provision was dropped in the amendment of 6th Feb. 2002.

Since 2000, a siphon is applied to expiring lease contracts if the quota is returned to the lessor and the lessor is no milk producer. In this case, 33 % of the quota is transferred to the national reserve.

4.5.2 Cases of inactivity

Rules for cases of inactivity are allowed under Article 15 of Council Regulation 1788/2003 (and previous legislation).

During the first years of the milk quota scheme, quota was taken away from producers if a farm had not supplied its complete milk quota in the milk quota year. The objective was to avoid the accumulation of quota for speculative purposes. Similar provisions were applied in the new federal states until March 2000: unused quota was retracted if less than 70 % of the quota was used.

At present, a retraction of quota takes place only when a lessor has received milk quota at the end of a leasing contract, but does not use or sell it during the following two years. Statistical data about the volume of retracted quota is not available. It can be assumed that

the volume is low due to the high value of quota. In Bavaria, about 0.8 % of quota was transferred to the 'Laender' reserve since 2000.

4.5.3 Impact of management of the national reserve

The current use of the national reserve to top up supply for successful bids at the auctions free of charge reduces costs for successful bidders. However, the extent of this effect cannot be predicted, and thus impacts on farmer's management is seen as negligible.

4.5.4 Farm management and environmental implications of management of the national reserve

As the national reserve has mainly been used for reduction of excess quota (first years of quota scheme), national balancing for reduction of super levy (1990 onwards) and supply of excess demand arising at the 'equilibrium' price determined at the auctions, impacts on the environment are seen as not significant.

4.6 Objectives of the milk quota regime

The national regulation on milk quota generally does not include any reference to objectives. An exception is the regulation from 2000, which mentions 'strengthening of competitiveness' as a formal objective. This paragraph was dropped again in the 2004 amendment.

The interviewed ministry experts indicated that at the time of the introduction of the milk quota scheme, the following policy objectives were mentioned: price stability; maintenance of income of milk producers, prevention of the migration of milk production from unfavourable locations by linking quota to land; maintaining the landscape. However, the link to land proved to be a major obstacle to structural change, and therefore quota transfer without land was introduced in 1993, the link to land abandoned in 2000 and interregional transfer allowed since 2007.

Regarding the decision related to the phasing out of milk quota after 2015, German agricultural policy will focus on measures which avoid a total abandonment of milk production in less favoured areas.

Indirectly, environmental objectives of the milk quota relate to preventing the abandoning of agriculture in unfavourable locations and maintaining the landscape. Fallow of land due

to the abandonment of milk production is not seen as a widespread problem by experts, as support from the agri-environmental programmes as well as the obligations for minimum maintenance under Cross Compliance have been preventing land abandonment. However, some grassland has been transformed to arable land.

4.7 Summary of the main impacts of the milk quota regime in Germany

At the time of the introduction of the quota system the structure of dairy production in Germany was rather unfavourable. The strict link of quota to land hindered structural adjustments in the first years of the quota system. The introduction of transfers without land in 1993 facilitated farm growth and the transfer of resources and production to the better farm managers and to locations best suited for dairy production; however the latter was restricted by the regional limitations of the trading zones. Larger regional shifts in production will be enabled by the reduction of the number of trading zones (just two trading zones since 2007).

Overall, structural change in dairy production has been strong (halving the number of dairy farms every ten years) despite the limitations by the quota system, to a large part induced by technical progress.

The quota auctions introduced in 2000 significantly improved the transparency of quota markets, however, at least during the first years, did not fulfil hopes for lower quota prices. High prices are partly due to the fact that many farmers continuously buy quota to match dairy yield increases, and with the strategy of holding cow number constant, the related bids at the auction generally reflect margins over variable costs of milk production. The abolishment of long term quota leasing is seen as a disadvantage, as it reduces flexibility and increases capital requirements.

The interview with experts and farmers also indicate that the main effects of the milk quota scheme and the restrictions on quota mobility are a slower and stunted development of the farms and their milk production.

Since 1993, German policy generally aimed at facilitating quota mobility. As a general rule, German politics follow the principle that the milk quota system should not be overloaded with environmental or structural policy objectives, as these are better targeted by specific agri-environmental and structural policies which are implemented via numerous programmes in Germany.

For the major part of the milk production, no negative environmental effects can be stated; however intensive dairy farms run into risk of not reaching the guidelines and limits stated in the EU Nitrate Directive.

Interviewed Farmers generally saw the environmental effects of dairy production to be small, with two farmers thinking that the milk quota have no positive effects on nature, and three farmers thinking that the milk quota have no negative effects on the environment. Some of the interviewed farmers in Bavaria indicated that currently they manage their land, especially grassland, very extensively and that without the quota they would keep more cows, and as a result of this, they would grow more fodder. Farmers expect negative effects of the quota especially in farms which don't have enough land: If these farms buy quota, then they are not able to spend money for the rental of additional land and will have to farm their land more intensively. As a negative effect of the limitation of production by quota, one farmer mentioned that milk production increases in countries with environmentally unfriendly housing systems and lower ecological standards (e.g., New Zealand, Argentina).

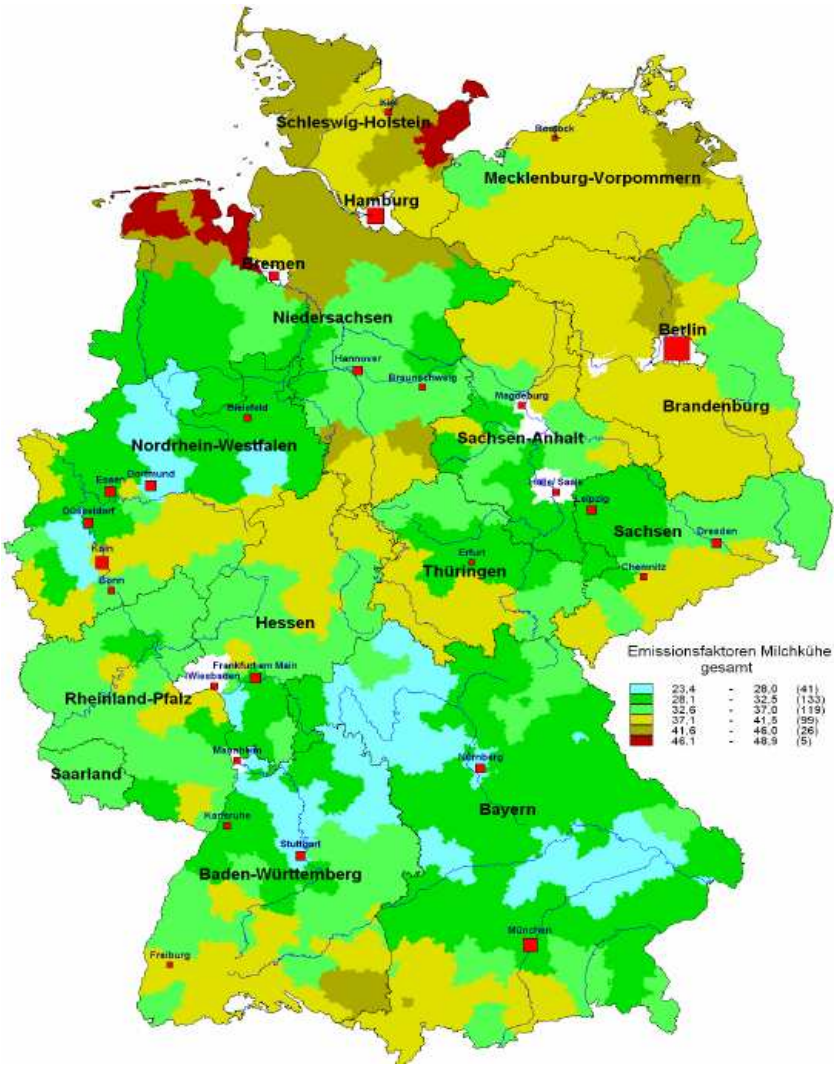
The increase of dairy yields as well as the trend to larger herds reduce the possibilities for grazing, and increase the need for purchased feed, which leads to larger nutrient surplus. Insofar, rules for allocation and transfer of milk quota which slow structural change may, at least in the short term, have positive effects on water quality.

Milk production is important with regard to landscape protection, as income source in connection with agro-tourism in attractive regions but also processing of milk to high value products. Fallow of land due to the abandonment of milk production is not seen as a widespread problem, as support from the agri-environmental programmes as well as the obligations for minimum maintenance under Cross Compliance have been preventing land abandonment. However, some grassland has been transformed to arable land, a trend that may increase in some areas with the policy reforms implemented in 2005 and which might be further aggravated with increased mobility of quota.

Ammonia emissions in dairy production depend on many factors: Stables (tie-stall better than free-stalls; stable better than grazing); manure system (liquid better than solid; covered storing much better than uncovered) and spreading system. A study by DÖHLER et al. (2002) combined these factors to provide an estimate of the regional distribution of total ammonia emission factors per dairy cow (Figure 4-1). Highest emission factors are estimated for the northern and eastern regions, a small strip across the middle of Germany, and the pre-alpine areas. However, as ammonia as well methane emissions per kg of milk produced decrease with dairy yields per cow (FLACHOWSKY and LEBZIEN, 2005), it is not possible to derive clear conclusions from these results with respect to the impact of the rules for allocation and transfer of milk quota. In this context, it is also interesting to no-

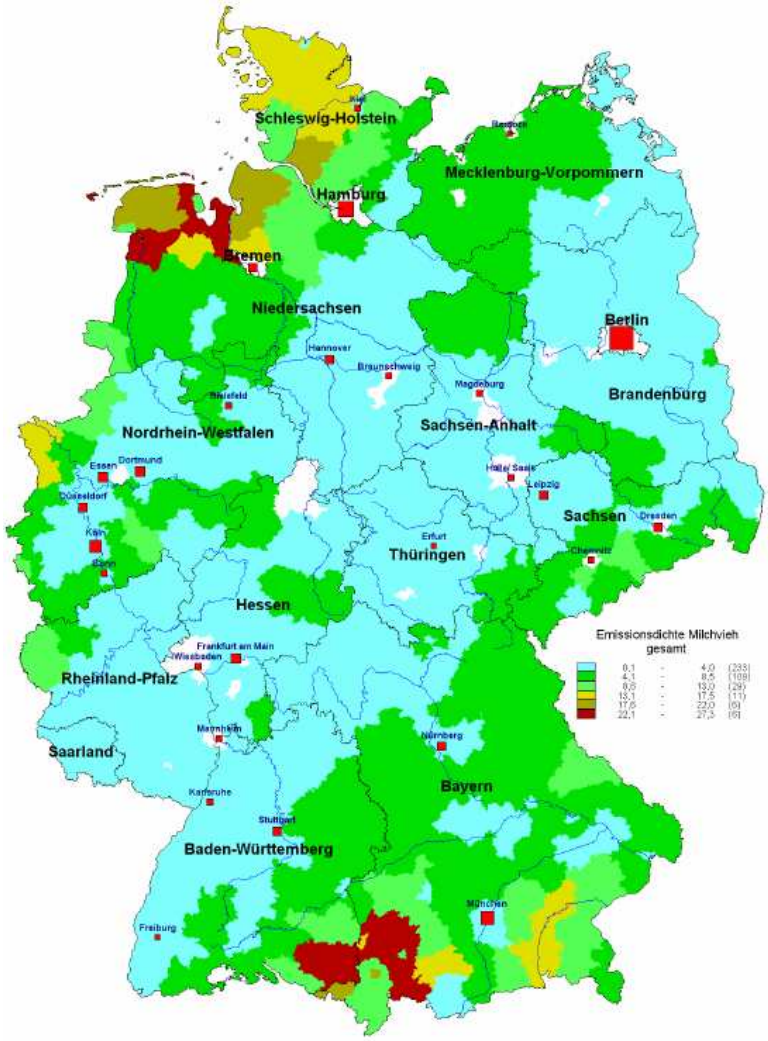
tice that interviewed farmers think that the milk yield per cow would be higher without milk quota. Combining the emission factors with the regional distribution of dairy production, an estimate of regional ammonia emissions from dairy production can be made (Figure 4-2). The highest densities of ammonia emissions are found in the grassland regions in the northwest and the south of Germany.

Figure 4-1: Ammonia emission factors for dairy cows in 1996, kg NH_3 per cow and year



Source: Döhler et al. (2002).

Figure 4-2: Ammonia emission from dairy production in 1996, NH_3 per ha and year



Source: Döhler et al., 2002.

Options wrt the reduction of negative environmental impacts of cattle production were analysed within a research project of TU Munich (KAPFER and HOFFMANN, 2004). Examinations indicate that with a strong increase of milk yield, nitrogen surpluses or methane emissions could be reduced, as long as the 'released' grassland is not used. However, if the 'released' grassland is used for suckler cows, the total impact will be negative.

Recently, biogas production became a strong competitor for dairy production in arable regions. Due to indirect subsidization via guarantied high prices for sales of electricity, biogas farms are able to pay prices for silage maize up to 2,000 €/ha, or rental land prices up to 1,000 €/ha. Livestock production is unable to compete under this price conditions. This will give a further incentive for a reallocation of milk production towards grassland regions.

5 Summary

At the time of the introduction of the quota system the structure of dairy production in Germany was rather unfavourable. The strict link of quota to land hindered structural adjustments in the first years of the quota system. Since 1993, German policy generally aimed at improving quota mobility. The introduction of transfers without land in 1993 facilitated farm growth and the transfer of resources and production to the better farm managers and to locations best suited for dairy production; however the latter was restricted by the regional limitations of the trading zones. The quota auctions introduced in 2000 significantly improved the transparency of quota markets, however, the accompanying abolishment of long term quota leasing reduced flexibility and increased capital requirements. Larger regional shifts in production will be enabled by the recent reduction of the number of trading zones (only two trading zones since 2007; one from 2010[5]). Overall, structural change in dairy production has been strong (halving the number of dairy farms every ten years) despite the limitations by the quota system. Still many regions in Germany, notably the case study region of Bavaria, are characterised by small farm structure, where the main share of milk production is still realised by small and medium sized farms.

Very little use has been made of the possibilities for preferential allocation of quota, and cases have been limited to a preferential allocation of milk quota to smaller farms or in favour of mountain areas in some regions in the first years of the milk quota regime, to resettled farmers in the New Laender and, on a very small regional scale, in favour of farms which manage grassland used by wild geese and in LFA's.

As a general rule, German politics follow the principle that the milk quota system should not be overloaded with environmental or structural policy objectives, as these are better targeted by specific agri-environmental and structural policies which are implemented via numerous programmes in Germany.

In general, few environmental effects are attributed to milk production. Intensive dairy farms may have problems in meeting the stocking rate limits of the Nitrate directive. Fallow of land due to the abandonment of milk production is not seen as a widespread problem, as support from the agri-environmental programmes as well as the obligations for minimum maintenance under Cross Compliance have been preventing land abandonment. However, some grassland has been transformed to arable land, a trend that may increase in some areas with the policy reforms implemented in 2005, and which might further be aggravated with increased mobility of quota. The increase of dairy yields as well as the trend to larger herds reduce the possibilities for grazing, and increase the need for pur-

[5] Due to strong opposition by Governments of the New Laender, the implementation of a single trading zone in 2010 was not realized.

chased feed, which leads to larger nutrient surplus. Insofar, rules for allocation and transfer of milk quota which impede regional mobility and slow structural change may, at least in the short term, have positive effects on water quality.

6 References

DICK J (2003) Die Milchquotenbörse in Bayern – Erfahrungen und Erkenntnisse nach zehn Börsenterminen. BAYERISCHE LANDESANSTALT FÜR LANDWIRTSCHAFT (LFL), INFORMATION. München

BAYERISCHE LANDESANSTALT FÜR LANDWIRTSCHAFT (LfL) (2006) Aspekte zur Nachhaltigkeit in der Tierischen Erzeugung, Schriftenreihe, Heft 4. ISSN 1611-4159, München

BAYERISCHE LANDESANSTALT FÜR LANDWIRTSCHAFT (LfL) (2007) Strategien zur Stärkung einer nachhaltigen und wettbewerbsfähigen Landbewirtschaftung in Bayern – Landwirtschaft 2020 –. Teil 1: Milcherzeugung. Schriftenreihe, Heft 5. ISSN 1611-4159. München

BAYERISCHE LANDESANSTALT FÜR LANDWIRTSCHAFT (LfL) (2007) Milchreport Bayern 2006 – Ergebnisse der Betriebszweigabrechnung Milchproduktion 2005/06. Institut für Agrarökonomie. München

BAYERISCHES STAATSMINISTERIUM FÜR LANDWIRTSCHAFT UND FORSTEN (2006) Bayerischer Agrarbericht 2006. München

BERTELSMEIERM, KLEINHANSS W, OFFERMANN F (2004) Rahmenbedingungen und Folgen unterschiedlicher Milchmarktpolitiken in Nordrhein-Westfalen. Arbeitsbericht 4/2004 des Instituts für Betriebswirtschaft der Bundesforschungsanstalt für Landwirtschaft (FAL). Braunschweig

BLE (2005) Ökologisch Märkte erschließen. Marktinformationen zu Öko-Milch & Öko-Molkereiprodukten in Deutschland. 2. aktualisierte Auflage. Bonn

BRÜMMER B, LOY JP, STRUVE C (2003) Beurteilung des Milchquotenbörsensystems in Deutschland, Agrarwirtschaft, Band 52(2003), S. 275-288

BUNDESMINISTERIUM FÜR VERBRAUCHERSCHUTZ, ERNÄHRUNG UND LANDWIRTSCHAFT (2005) Die Unternehmensstruktur der Molkereiwirtschaft in Deutschland. Bonn

BUSSE CH (2006) Titel II. Die Landwirtschaft. In: LENZ C, BORCHARDT KD [Eds], EU- und EG-Vertrag, Kommentar, p 460-616, Köln

DEUTSCHER RAIFFEISENVERBAND E.V. (1991) Die Milchquotenregelung – Darstellung der ersten sieben Quotenjahre. Neuwied: Raiffeisendruckerei GmbH

DEUTSCHER RAIFFEISENVERBAND E.V. (1995) Die Milchquotenregelung – Aktualisierte Darstellung und Zwischenbilanz. Wiesbaden: Deutscher Genossenschafts-Verlag eG

DÖHLER H, EURICH-MENDEN B, DÄMMGEN U, OSTERBURG B, LÜTTICH M, BERGSCHMIDT A, BERG W, BRUNSCH R (2002): BMVEL/UBA-Ammoniak-Emmissionsinventar der deutschen Landwirtschaft und Minderungsszenarien bis zum Jahre 2010. Berlin : Umweltbundesamt, 307 p, Texte Umweltbundesamt 02/05

FLACHOWSKY G, LEBZIEN P (2005) Weniger Spurengase durch gezielte Ernährung der Nutztiere Potenziale und Einflussmöglichkeiten bei Wiederkäuern und Nichtwiederkäuern. Forschungsreport 1/2005: 7-9

GEHRKE H (1996) Die Milchquotenregelung. Schriftenreihe des Instituts für Landwirtschaftsrecht der Universität Göttingen, Band 46. Dissertation. Köln: Carl Heymanns Verlag KG

GEIGER, U. (2006) Die Struktur der Anbieter- und Nachfrager an der Milchquotenbörse in Bayern. Bayerische Landesanstalt für Landwirtschaft, Schriftenreihe, Heft 11, München

GÖMANN H, KREINS P, PLANKL R (2007) Auswirkungen der Umsetzung der Agrarreform bis 2015 auf die Landwirtschaft in Berggebieten, Studie im Auftrag des BMELV. Institut für Ländliche Räume (FAL) (unpublished)

HEIßENHUBER A, HOFFMANN H, HEBAUER CH (2007) Strategien zur Steuerung des Milchmarktes bis 2014/15. Agra-Europe27/07, Dokumentation, 1-10

HOFFMANN H (2007) Situation des exploitations des zones de montagne en Allemagne et propositions des producteurs de lait allemands en matière de politique laitière en montagne. Clermont Ferrand, 04.10.2007 (ppt-presentation)

ISERMEYER F, BROCKMEIER M, GÖMANN H, HARGENS R, KLEPPER R, KREINS P, OFFERMANN F, OSTERBURG B, PELIKAN J, SALAMON P, THIELE H (2006) Analyse politischer Handlungsoptionen für den Milchmarkt. Landbauforschung Völkenrode, Sonderheft 300. Braunschweig

KAPFER M, HOFFMANN H (2004) Beurteilung von extensiver und intensiver Milch- und Rindfleischproduktion hinsichtlich ökologischer, einzelbetrieblicher und volkswirtschaftlicher Auswirkungen. Endbericht zum Forschungsauftrag des StMLF. Technische Universität München, Lehrstuhl für Wirtschaftslehre des Landbaues. Freising-Weihenstephan (unpublished)

OSTERBURG B, ZANDER K (2004) Regionale Strukturen des ökologischen Landbaus in Deutschland. Braunschweig : FAL, 81 p, Arbeitsbericht Bereich Agrarökonomie 2004/08

MILCHINDUSTRIE-VERBAND (2006) Einblick – Analysen und Perspektiven. Geschäftsbericht 2005/2006. Bonn (including MIV-ZMP CD-ROM: Zahlen. Daten, Fakten)

SEIBERT O, GEIßENDÖRFER M (2007) Evaluation of the Environmental Impacts of CAP (Common Agricultural Policy) Measures related to the Beef and Veal Sector and the Milk Sector. – Environmental Impacts of CMO Measures in the Beef and Veal Sector and in the Dairy Sector. Forschungsgruppe Agrar- und Regionalentwicklung Triesdorf (ART)

THIELE G (1997) Das Recht der Gemeinsamen Agrarpolitik der EG: dargestellt am Beispiel des Gemeinsamen Milchmarktes mit Bezügen zum Durchführungsrecht in der Bundesrepublik Deutschland. In: Schriften zum Europäischen Recht, Band 46. (Eds: MAGIERA S, MERTEN D). Berlin: Duncker und Humbolt

THIELE H (2007): Wo wandert die Milchquote ab Juli hin? Landpost, Ausbildung und Beratung, 38-40

UBA, UMWELTBUNDESAMT (2002) (Eds: BMVEL/ UBA-Ammoniak-Emissions-Inventar der deutschen Landwirtschaft und Minderungsszenarien bis zum Jahre 2010. Forschungsbericht 299 42 245/02, UBA-FB 000249, Berlin

ZMP (2007) Bio-Milch und -Molkereiprodukte 2006. http://www.oekolandbau.de/haendler/marktinformationen/produktmaerkte/milch-und-molkereiprodukte/042007-bio-milch-und-molkereiprodukte/

Annex

Annex 1 **List of interviews**

Annex 2 **Transcripts of interviews with Farmers**

Annex 3 **Structural indicators of FADN Farms**

Annex 1 List of interviews

MinRätin Dr. B. Hartwig, Oberamtsrat T. Höller and Dr. Busse
Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz,
Bonn-Duisdorf

Oberamtsrat G. Kraenzler
Bundesministerium der Finanzen, Bonn

Dipl.-Ing. agr. M. Brandl
Milchindustrie-Verband e.V. (MIV), Bonn

Dr. G. Dorfner und J. Dick
Bayerische Landesanstalt für Landwirtschaft (LfL), München

Prof. Dr. agr. Dr. agr. habil. H.Hoffmann und Dipl.-Ing. agr. C. Hebauer
Technische Universität München, Freising

Annex 2 Transcripts of interviews with Farmers

General data of the interviewed farms

Five dairy farmers in Bavaria were interviewed to assess the impacts of the milk quota system. The farms are located in different regions.

Some general data of the farms are given in Table A2-1. The majority of the interviewed family farms are larger farms with a higher number of dairy cows than in the average dairy farm in Bavaria. Most of the farms have a likely successor; in some of these farms the successor is already involved in the management or works of the farm.

Table A2-1: Characteristics of interviewed farms

Region	Number of dairy cows	LFA	Total UAA (ha)	KULAP	Average milk yield (kg)	Breed	Housing system	Other activities
Upper Palatinate	50	Yes	53	Reduced chemical pesticides	5,000	Simmental	Loose housing stable	
Allgaeu	40	Yes (mountain area)	40	Reduced mineral fertiliser	10,000	Brown Swiss	Loose housing stable	Tourism (holiday flats)
Lower Franconia	50	No	62		7,300	Simmental	Stanchion barn	Vineyards
Middle Franconia	38	Yes	50	No mineral fertiliser	7,600	Simmental	Loose housing stable	Breeding of young cattle
Middle Franconia	88	Yes	47		8,400	Simmental	Loose housing stable	

Source: Farm interviews

All the farms keep the cows in stables throughout the whole year. The most common housing system is the loose housing stable. Some farms switched to this housing system more than 20 years ago, one farmer built a loose housing stable only 2 years ago and one of the interviewed farms still keeps the cows in a stanchion barn. Four farms have cattle of the most common breed in Bavaria, the Fleckvieh (Simmental). The farm in the Allgäu keeps Brown Swiss cows which are common in this region.

Young cattle are kept on pasture during the summer on the farm in the Allgäu and in hilly parts of Middle Franconia .

In all farms the main part of the feeding ration is silage. The proportion of maize / grass silage is different and depends on the regional conditions. All farms purchase concentrated feed, some use home grown cereals feeds and buy only mineral feed. Some farmers mentioned that the rental prices for land have increased due to the establishment of new

biogas plants. Two farmers also sell silage maize to biogas plants. The concentration of biogas plants is lower in regions like the Allgäu or Upper Palatinate.

In Bavaria, the KULAP program (cultural landscape program) gives farmers the opportunity to receive subsidies if, e.g., they reduce the use of pesticides or if they refrain from using mineral fertilisers. Several of the surveyed farms are involved in these programs. In most cases, these farms have sufficient land for their livestock and don't have to farm in a very intensive way to produce fodder. The Nitrate Directive (which is limiting cattle stocking rates) is a limiting factor for only one farm.

Changes over time

The changes over time are shown in Tables A2-2 and A3-3. In 1980 nearly all farms had the same number of cows. The stanchion barn was the standard housing system in each farm. All of the farms changed their feeding system from a seasonal to a year-round system. They provide feed to cows using a chopping mixer wagon.

Table A2-2: Changes in farm structure

	Number of dairy cows				Average milk yield (kg)				Housing system			
Region	1980	1990	2000	2007	1980	1990	2000	2007	1980	1990	2000	2007
Upper Palatinate	20	40	50	50	4,000	4,200	4,800	5,000	stanchion barn	loose housing stable		
Allgaeu	14	18	45	48	6,000	8,000	9,000	10,000	stanchion barn			loose housing stable
Lower Franconia	35	30	30	50	4,500	5,000	6,000	7,300	stanchion barn			
Middle Franconia	30	30	30	38	5,400	6,000	8,700	7,500	stanchion barn			loose housing stable
Middle Franconia	40	64	72	88	6,600	6,900	7,200	8,400	stanchion barn	loose housing stable		

Source: Farm interviews

Table A2-3: Changes in milk quota

Region	Distribution of quotas	Hardship case	Tons milk quota/year			
			1984	1990	2000	2007
Upper Palatinate	1984	Yes	180	150	200	250
Algaeu	1984		84	120	250	360
Lower Franconia	1984		180	200	280	350
Middle Franconia	1984	Yes	150	160	186	247
Middle Franconia	1984		250	390	470	600

Source: Farm interviews

Hardship cases

One farm built a new stable for about 50 dairy cows in the year 1983. In 1980 this farm kept 20 cows. The farm received 180 tons of milk quota which was reduced ein succeeding years to 150 tons. Another farm applied as a hardship case because the milk yield per cow was higher than the average milk yield in the region.

Permanent transfer of milk quota

All the farms obtained their first milk quota in the year 1984. Most of them bought additional quota in the following years. Only three farms rented milk quota from neighbours (with and without land). Two farmers mentioned that at first the quota was rented from a neighbour (with land) and it was bought later because the lessor sold it. After the implementation of the milk quota it was sometimes cheap to buy quota, but in the years before the milk quota auction was established, the prices were very high and the market wasn't transparent. Since the auction was established the farmers bid and more often buy additional milk quota. All farmers preferred the new system for quota transfer because the price is now more stable.

However, the price per kg varied between the different trading regions in Bavaria. The farm in Upper Palatinate bought a great amount of quota in 2007 (50 tons) because the price decreased from approx. 75 ct/kg to 41.5 ct/kg, whereas the farm in lower Franconia didn't bid at the last auction because they bought quota in former years for approx. 20 ct/kg. Some farms received additional milk quota from the national reserve when they bought quota at the auction. Farmers didn't buy much quota due to liquidity problems.

Table A2-4: Response to the quota limit

Region	Actual quota level Tons Milk quota/year	Production of milk			Response to an exceeding of the quota limit
		under	at quota level	over	
Upper Palatinate	250	+	+		Feed calves with milk, reduce concentrate feed
Allgaeu	360			+	Pay super levy, sell more young cows, lease milk quota
Lower Franconia	350			+	Buy quota
Middle Franconia	247		+	+	Pay super levy, sell more young cows
Middle Franconia	600			+	Pay super levy, buy quota

Source: Farm interviews

Most of the farms produce more milk than their quota level. One farm supplies the milk to a dairy company cooperating with a dairy in the new federal states. This dairy doesn't fulfil the quota level so it's possible to sell more milk. The farmer is hoping that the national milk production is below the allowed level. In Table A2.4 the main reactions of the farmers in response to overproduction of quota are summarized.

Impacts of the quota to the management of dairy farms

The main effects of the milk quota were described as a slower and stunted development of the farm and milk production. Especially small farms had the chance to survive. Some farms don't see the quota as a limiting factor e.g., the farm that built a stable in 1982 didn't want to expand in the years thereafter. One farmer was not sure whether the money he spent for milk quota would be available for investments because the milk price would have been probably lower. The same farmer added that his farm wouldn't be bigger without the quota; he thinks that 88 dairy cows are quite enough for a family farm.

However, most farmers think that the quota is a limiting factor for their farm development. Some farms can't use their whole stable for dairy cows, another farm didn't expand its dairy cow stock, and another farm didn't build a new stable.

Only one farmer believes that he would manage his farm differently if there were no milk quota. Others think their farms would be bigger now, but two farmers commented that they are not sure if they would still exist today. Moreover they think that the milk yield per cow would be higher without the milk quota.

Impacts on the environment

Three of the interviewed farmers have enough land for their limited number of dairy cows. They don't farm very intensively and they participate in the KULAP- program. In some cases, especially grassland is farmed very extensively. The farmers think that without the

quota they would keep more cows, and as a result of this, they would use more fodder. Another positive effect for the environment is that smaller farms can still exist. Two farmers think that the milk quota have no positive effects on nature.

Three farmers don't think that the milk quota have negative effects on the environment.

Negative effects of the quota are seen especially in farms which don't have enough land. If they buy quota they are not able to spend money for the rental of additional land, and thus would farm their land more intensively. One farmer mentioned that milk production increases in countries with environmentally unfriendly housing systems and lower ecological standards (e.g., New Zealand, Argentina)

Impacts of the abolishment of quota for the farms

More than half of the interviewed persons, especially older farmers, would like to retain a quota system in the future, some of them think that the current system should be adapted, e.g., the quantity of quota should be controlled by a farmers association. Especially young farmers would prefer to phase-out the milk quota system. Most of the interviewed farmers think that transitional arrangements are necessary.

Farmers' reaction to an abolishment would be to expand their milk production and use idle stable capacities to keep more cows. Some of them think that in an open market they would have to cut down the costs of production, others would probably not be involved in the KULAP program anymore. Only two think they would build bigger stables. Four of the farms keep Fleckvieh. If the quota system were to be removed, two of the farmers propose to use Holstein Friesian dairy cows.

One farmer thinks that he would adjust his milk and fodder production depending on the milk prices development. In periods of a high milk price he probably would produce intensively and in periods of low prices he would produce less milk and more extensively.

In the time before the abolishment of quota, farmers hope to buy cheap quota and to grow step by step. It will be possible to calculate exactly how much money can be paid for additional quota. Some will save for investments after quota abolishment.

Annex 3 Structural indicators of FADN Farms

Table A3-1: Structural indicators and development of specialised dairs farms (TF41) in Germany by Laender

Year		1991	1994	1998	2004	2005	1991	1994	1998	2004	2005
		(010) Schleswig-Holstein					**(030) Niedersachsen**				
Farms represented (SYS02)		9,540	7,340	6,740	4,390	4,390	23,720	17,500	15,570	10,410	10,410
Economic size (SE005)	ESU	50.6	56.9	70.2	100.4	99.0	41.6	51.4	61.1	92.5	95.7
Total labour input (SE010)	AWU	1.7	1.7	1.8	1.8	1.8	1.5	1.6	1.7	1.8	1.9
Total Utilised Agricultural Area (SE025)	ha	50.4	57.2	63.4	75.1	77.0	38.0	45.1	50.3	68.4	71.9
Rented U.A.A. (SE030)	ha	19.5	25.7	30.6	38.8	37.9	19.7	23.4	29.0	44.5	45.9
Forage crops (SE071)	ha	42.9	48.7	53.9	61.0	59.7	32.0	38.4	43.0	59.2	60.9
Set aside (SE073)	ha	0.0	1.7	1.6	2.3	2.4	0.0	0.9	0.6	1.6	1.7
Total livestock units (SE080)	LU	89.9	99.5	113.0	132.8	128.8	66.8	75.9	89.5	123.2	128.3
Dairy cows (SE085)	LU	39.6	46.8	52.0	62.1	61.2	28.9	34.6	40.0	59.1	61.4
Other cattle (SE090)	LU	46.2	49.4	57.1	63.2	64.3	32.3	36.2	42.6	58.4	62.2
Pigs (SE100)	LU	3.3	3.0	3.3	6.6	2.4	5.1	4.4	6.0	5.3	4.3
Stocking density (SE120)	LU/ha	2.0	1.8	2.0	2.0	1.9	1.9	1.8	1.9	1.9	1.9
Milk yield (SE125)	kg/cow	5,488	5,994	6,442	7,403	7,367	5,693	6,167	6,511	7,204	7,216
Total intermediate consumption (SE275)	€	60,032	75,353	80,967	113,191	167,669	48,566	60,484	63,179	101,463	142,926
Feed for grazing livestock (SE310)	€	19,252	24,706	14,743	26,052	23,364	15,813	19,134	20,077	31,964	31,629
Feed for grazing livestock home-grown (SE315)	€	3,103	3,249	1,920	2,028	1,571	2,754	2,686	2,902	3,522	3,406
		(050) Nordrhein-Westfalen					**(060) Hessen**				
Farms represented (SYS02)		12,530	9,790	9,060	4,290	4,290	4,310	4,360	3,200	2,540	2,540
Economic size (SE005)	ESU	35.8	45.7	50.3	74.7	76.3	27.7	34.5	50.0	70.8	69.8
Total labour input (SE010)	AWU	1.5	1.6	1.5	1.6	1.6	1.5	1.5	1.8	1.7	1.8
Total Utilised Agricultural Area (SE025)	ha	32.1	38.0	40.9	51.5	53.7	30.5	37.7	50.6	68.1	71.0
Rented U.A.A. (SE030)	ha	16.8	21.5	25.3	32.0	34.0	14.8	20.9	31.4	51.6	54.0
Forage crops (SE071)	ha	26.5	31.7	34.2	41.7	42.3	20.7	27.0	36.5	48.9	50.6
Set aside (SE073)	ha	0.0	0.6	0.9	1.3	1.2	0.0	0.9	0.8	1.9	1.7
Total livestock units (SE080)	LU	56.1	64.5	72.7	90.5	91.3	41.1	48.9	71.0	82.9	83.0
Dairy cows (SE085)	LU	27.9	33.8	36.4	48.4	49.9	20.5	25.3	35.9	46.4	45.6
Other cattle (SE090)	LU	24.5	27.9	31.6	34.5	34.9	17.8	20.8	31.4	34.1	34.8
Pigs (SE100)	LU	3.3	2.4	4.1	6.9	6.1	2.5	2.7	3.5	2.1	2.3
Stocking density (SE120)	LU/ha	2.0	1.9	1.9	1.9	1.9	1.8	1.7	1.8	1.6	1.5
Milk yield (SE125)	kg/cow	5,623	5,968	6,344	7,396	7,485	5,381	5,421	6,136	6,602	6,658
Total intermediate consumption (SE275)	€	44,236	56,032	57,654	89,724	117,118	35,427	44,072	59,493	80,071	101,392
Feed for grazing livestock (SE310)	€	13,315	17,551	16,722	25,799	25,654	10,993	12,174	19,204	23,801	22,676
Feed for grazing livestock home-grown (SE315)	€	3,308	3,316	3,085	3,471	3,138	5,289	5,241	8,540	7,988	8,100

Source: http://ec.europa.eu/agriculture/rica/database/database.cfm

Table A3-2: Structural indicators and development of specialised dairs farms (TF41) in Germany by Laender

Year		1991	1994	1998	2004	2005	1991	1994	1998	2004	2005
		(070) Rheinland-Pfalz					**(080) Baden-Württemberg**				
Farms represented (SYS02)		4,880	3,280	2,660	1,940	1,940	16,530	12,460	12,300	7,570	9,010
Economic size (SE005)	ESU	30.7	40.1	53.5	75.2	77.5	24.6	29.2	34.0	55.7	48.2
Total labour input (SE010)	AWU	1.5	1.6	1.9	1.7	1.8	1.6	1.5	1.7	1.6	1.5
Total Utilised Agricultural Area (SE025)	ha	35.1	42.7	53.2	71.0	76.1	28.0	32.8	34.8	47.5	43.0
Rented U.A.A. (SE030)	ha	16.4	23.8	31.6	48.6	52.0	12.1	16.8	18.6	29.7	27.9
Forage crops (SE071)	ha	26.9	33.3	40.6	54.1	57.6	22.2	26.1	28.3	37.1	34.1
Set aside (SE073)	ha	0.0	0.2	0.6	1.5	1.3	0.0	0.5	0.3	0.9	0.6
Total livestock units (SE080)	LU	50.7	61.7	76.7	87.4	90.9	42.8	48.2	50.9	66.9	57.5
Dairy cows (SE085)	LU	27.2	34.0	40.9	51.2	52.3	23.2	26.8	28.2	39.6	35.0
Other cattle (SE090)	LU	22.1	26.2	34.3	35.4	37.8	17.4	19.9	20.3	25.5	21.0
Pigs (SE100)	LU	1.3	1.2	1.4	0.5	0.5	1.5	1.0	1.3	1.7	1.4
Stocking density (SE120)	LU/ha	1.8	1.8	1.8	1.6	1.5	1.8	1.8	1.7	1.7	1.6
Milk yield (SE125)	kg/cow	5,112	5,411	6,148	6,539	6,826	4,663	4,860	5,404	6,059	5,862
Total intermediate consumption (SE275)	€	38,719	50,977	57,632	83,337	112,132	32,181	39,781	39,891	62,981	67,885
Feed for grazing livestock (SE310)	€	12,132	15,819	17,345	22,325	23,465	10,411	12,106	10,129	17,220	14,383
Feed for grazing livestock home-grown (SE315)	€	4,051	4,739	5,077	4,767	5,297	4,545	4,613	3,003	3,964	3,464
		(090) Bayern					**(112) Brandenburg**				
Farms represented (SYS02)		66,930	55,790	52,710	33,670	39,160	310	320	320		
Economic size (SE005)	ESU	23.6	26.7	30.7	45.8	41.5	202.2	235.9	233.9		
Total labour input (SE010)	AWU	1.5	1.4	1.5	1.6	1.5	8.5	5.8	5.7		
Total Utilised Agricultural Area (SE025)	ha	23.4	25.4	28.6	36.9	34.3	283.3	285.3	283.8		
Rented U.A.A. (SE030)	ha	8.2	9.9	12.1	19.4	18.0	261.9	236.8	227.2		
Forage crops (SE071)	ha	16.7	17.9	21.4	28.1	25.4	175.8	167.4	157.9		
Set aside (SE073)	ha	0.0	0.6	0.4	0.8	0.7	17.4	24.9	19.4		
Total livestock units (SE080)	LU	38.6	40.4	45.2	55.5	49.7	339.0	235.1	244.1		
Dairy cows (SE085)	LU	20.6	21.6	24.1	31.3	28.6	164.0	141.6	140.4		
Other cattle (SE090)	LU	16.2	17.3	19.1	23.1	20.4	123.5	91.5	101.0		
Pigs (SE100)	LU	1.7	1.4	1.8	0.9	0.5	50.6	1.7	2.5		
Stocking density (SE120)	LU/ha	2.2	2.1	2.0	1.9	1.8	1.5	1.2	1.2		
Milk yield (SE125)	kg/cow	4,761	5,134	5,548	6,210	6,116	6,271	7,365	7,521		
Total intermediate consumption (SE275)	€	31,608	36,254	35,723	53,492	61,886	323,695	279,852	414,675		
Feed for grazing livestock (SE310)	€	9,880	11,198	10,677	15,214	13,512	103,981	90,039	87,336		
Feed for grazing livestock home-grown (SE315)	€	4,745	4,667	4,408	5,435	5,176	33,489	20,925	16,569		

Source: http://ec.europa.eu/agriculture/rica/database/database.cfm

Table A3-3: Structural indicators and development of specialised dairs farms (TF41) in Germany by Laender

Year		1991	1994	1998	2004	2005	1991	1994	1998	2004	2005
		(113) Mecklenburg-Vorpommern					**(114) Sachsen**				
Farms represented (SYS02)				460	310	310			740	550	690
Economic size (SE005)	ESU			123.1	392.7	374.4			81.5	286.0	243.3
Total labour input (SE010)	AWU			3.9	7.0	7.5			3.0	9.0	8.0
Total Utilised Agricultural Area (SE025)	ha			189.8	347.5	355.8			95.7	264.5	222.5
Rented U.A.A. (SE030)	ha			173.5	268.2	258.2			81.8	227.8	187.8
Forage crops (SE071)	ha			129.9	206.5	221.3			59.8	144.8	115.9
Set aside (SE073)	ha			6.0	22.4	15.2			2.8	5.6	5.5
Total livestock units (SE080)	LU			165.7	387.7	383.3			104.1	271.4	233.7
Dairy cows (SE085)	LU			106.4	243.3	234.3			63.4	154.2	132.3
Other cattle (SE090)	LU			59.0	144.3	141.1			39.6	106.7	91.2
Pigs (SE100)	LU			0.1	0.0	7.8			0.4	9.2	9.0
Stocking density (SE120)	LU/ha			1.2	1.7	1.5			1.6	1.7	1.8
Milk yield (SE125)	kg/cow			6,470	7,511	7,834			6,017	7,705	7,904
Total intermediate consumption (SE275)	€			160,886	512,025	697,231			100,418	390,957	452,609
Feed for grazing livestock (SE310)	€			19,074	132,082	118,127			32,788	113,081	99,774
Feed for grazing livestock home-grown (SE315)	€			2,254	40,116	39,638			12,856	32,140	34,213
		(115) Sachsen-Anhalt					**(116) Thueringen**				
Farms represented (SYS02)				260	240	240			210	220	220
Economic size (SE005)	ESU			241.5	250.2	267.4			78.1	365.7	410.0
Total labour input (SE010)	AWU			8.2	5.4	6.1			3.2	11.5	12.7
Total Utilised Agricultural Area (SE025)	ha			215.1	222.9	268.8			90.7	383.5	437.4
Rented U.A.A. (SE030)	ha			183.9	205.7	249.3			77.5	356.8	405.3
Forage crops (SE071)	ha			140.9	134.3	143.3			68.4	246.4	274.2
Set aside (SE073)	ha			14.3	14.9	19.8			1.6	6.2	8.8
Total livestock units (SE080)	LU			316.0	241.3	258.0			113.9	348.8	388.2
Dairy cows (SE085)	LU			194.8	159.5	170.7			67.7	198.3	215.3
Other cattle (SE090)	LU			120.9	81.3	87.0			44.4	135.8	154.0
Pigs (SE100)	LU			0.1	0.1	0.3			1.1	5.7	8.3
Stocking density (SE120)	LU/ha			2.0	1.6	1.4			1.6	1.4	1.3
Milk yield (SE125)	kg/cow			6,746	7,313	7,317			5,871	7,667	7,865
Total intermediate consumption (SE275)	€			327,489	291,956	466,805			100,353	510,516	694,726
Feed for grazing livestock (SE310)	€			138,716	91,146	99,892			35,851	193,707	199,088
Feed for grazing livestock home-grown (SE315)	€			13,607	9,545	6,191			10,509	86,496	92,352

Source: http://ec.europa.eu/agriculture/rica/database/database.cfm

Arbeitsberichte aus der vTI-Agrarökonomie

Nr. 01/2008 Margarian A:
Sind die Pachten im Osten zu niedrig oder im Westen zu hoch?

Nr. 02/2008 Lassen B, Friedrich C, Prüße H:
Statistische Analysen zur Milchproduktion in Deutschland – Geografische Darstellung (Stand: Januar 2008)

Nr. 03/2008 Nitsch H, Osterburg B, von Buttlar Ch, von Buttlar HB:
Aspekte des Gewässerschutzes und der Gewässernutzung beim Anbau von Energiepflanzen

Nr. 04/2008 Haxsen G:
Calculating Costs of Pig Production with the InterPIG Network

Nr. 05/2008 Efken J:
Online-Befragung von Erhalterinnen seltener Nutztiere oder Nutzpflanzen zu Ihren Aktivitäten und Einstellungen

Nr. 06/2008 Rudow K, Pitsch M:
Fallstudie zur Wirkung der Ausgleichszulage im Landkreis Oberallgäu (Bayern)

Nr. 07/2008 Daub R:
Fallstudie zur Wirkung der Ausgleichszulage im Landkreis Vogelsberg (Hessen)

Nr. 08/2008 Haxsen G:
Interregionale und internationale Verflechtung der Ferkelversorgung in Deutschland – Berechnung regionaler Versorgungsbilanzen und Kalkulationen der Produktionskosten für Ferkel im interregionalen sowie internationalen Vergleich

Nr. 09/2008 Lassen B, Isermeyer F, Friedrich C:
Milchproduktion im Übergang – eine Analyse von regionalen Potenzialen und Gestaltungsspielräumen

Nr. 10/2008 Gasmi S:
Fallstudie zur Wirkung der Ausgleichszulage im Landkreis St. Wendel (Saarland)

Die *Arbeitsberichte aus der vTI-Agrarökonomie* können unter
http://www.vti.bund.de/en / institute/bw/publikationen/downloads.htm
kostenfrei heruntergeladen werden.

Nr. 11/2008 Pohl C:

Fallstudie zur Wirkung der Ausgleichszulage im Altmarkkreis Salzwedel (Sachsen-Anhalt)

Nr. 12/2008 Gömann H, Heiden M, Kleinhanß W, Kreins P, von Ledebur EO, Offermann F, Osterburg B, Salamon P:

Health Check der EU-Agrarpolitik – Auswirkungen der Legislativvorschläge

Nr. 13/2008 von Ledebur EO, Ehrmann M, Offermann F, Kleinhanß W:

Analyse von Handlungsoptionen in der EU-Getreidemarktpolitik

Nr. 14/2008 Ehrmann M, Kleinhanß W:

Review of concepts for the evaluation of sustainable agriculture in Germany and comparison of measurement schemes for farm sustainability.

Nr. 01/2009 Gömann H, Kleinhanß W, Kreins P, von Ledebur EO, Offermann F, Osterburg B, Salamon P:

Health Check der EU-Agrarpolitik – Auswirkungen der Beschlüsse

Nr. 02/2009 Schmitz J, von Ledebur, EO:

Maispreisverhalten – Maispreistransmission während des Preisbooms an den Terminmärkten

Nr. 03/2009 Osterburg B, Nieberg H, Rüter S, Isermeyer F, Haenel HD, Hahne J, Krentler JG, Paulsen HM, Schuchardt F, Schweinle J, Weiland P:

Erfassung, Bewertung und Minderung von Treibhausgasemissionen des deutschen Agrarsektors und Verbraucherschutz

Nr. 04/2009 Osterburg B, Röder N, Elsasser P, Dieter M, Krug J:

Analyse ausgewählter internationaler Studien und Dokumente über Kosten und Potenziale der Minderung von Treibhausgasemissionen sowie des Aufbaus und der Erhaltung von C-Senken im deutschen Agrar- und Forstsektor

Nr. 05/2009 Lutter M:

Strukturwandel in der europäischen Milchviehhaltung: Ergebnisse einer regional differenzierten Befragung

Die *Arbeitsberichte aus der vTI-Agrarökonomie* können unter http://www.vti.bund.de/en/_institute/bw/publikationen/downloads.htm kostenfrei heruntergeladen werden.

Nr. 06/2009 Pufahl A:

Einkommens- und Beschäftigungswirkungen von Agrarumweltmaßnahmen, der Ausgleichszulage für benachteiligte Gebiete und der Ausgleichszahlung für Gebiete mit umweltspezifischen Einschränkungen

Nr. 07/2009 Osterburg B, Nitsch H, Laggner B, Roggendorf W:

Auswertung von Daten des Integrierten Verwaltungs- und Kontrollsystems zur Abschätzung von Wirkungen der EU-Agrarreform auf Umwelt und Landschaft

Nr. 08/2009 Lassen B, Busch G:

Entwicklungsperspektiven der Milchproduktion in verschiedenen Regionen Niedersachsens– ein agri benchmark dairy-Projekt (in Arbeit)

Nr. 01/2010 Plankl R, Weingarten P, Nieberg H, Zimmer Y, Isermeyer F, Krug J, Haxsen G:

Quantifizierung „gesellschaftlich gewünschter, nicht marktgängiger Leistungen“ der Landwirtschaft

Nr. 02/2010 Steinrück B, Küpper P:

Mobilität in ländlichen Räumen unter besonderer Berücksichtigung bedarfsgesteuerter Bedienformen des ÖPNV

Nr. 03/2010 Tietz A:

Auswirkungen von Health Check und EU-Konjunkturprogramm auf die ländlichen Entwicklungsprogramme der deutschen Bundesländer

Nr. 04/2010 Becker H, Strohm-Lömpcke R:

Wohnortnahe Grundschulversorgung in ländlichen Räumen - Rahmenbedingungen und Gestaltungsmöglichkeiten

Nr. 05/2010 Rothe A, Osterburg B:

Entwicklung der Biogasproduktion in Niedersachsen und Auswirkungen auf die Flächennutzung

Nr. 06/2010 Friedrich C:

Milchverarbeitung und -vermarktung in Deutschland – eine deskriptive Analyse der Wertschöpfungskette

Nr. 07/2010 Kleinhanß W, Offermann F, Ehrmann M:

Evaluation of the Impact of Milk quota – Case Study Germany

Die *Arbeitsberichte aus der vTI-Agrarökonomie* können unter
http://www.vti.bund.de/en / institute/bw/publikationen/downloads.htm
kostenfrei heruntergeladen werden.