

*Typical and traditional productions:
Rural effect and agro-industrial problems*
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The local systems of the food industry in Italy[?]

ABSTRACT

The traditional and typical agro-food productions are often strictly connected to the presence of the local systems of production. In this work we underline the importance of local economies in the Italian Food Industry, and we try to identify the most important agro-food local systems. The utilisation of information from the last Census of Industry (1991), at a municipal level and for all the agro-food industry sectors (nine), allows to define a general methodology for the localisation and identification of the most important agro-food local economies. We built six main indexes on localisation, concentration and specialisation of the agro-food industry. The analysis carried out gives a complete picture of the presence of agro-food industry local systems for the nine most important sub-sectors of food industry, also if in this work we describe only the meat and the dairy sectors.

1. INTRODUCTION

In the last decade many authors devoted themselves to the study of local development models in order to better point out the territorial differentiation in Italy. In the same time there has also been a large number of contributions in the analysis of the agro-food sector, with more emphasis on the regional and on the local development. In the analysis of the local and regional development in the agro-food sector, three phases can be distinguished. In the first one, the main interest on the study

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of agricultural development's at territorial level introducing also social and economical variables into the analysis, overtaking the previous sectorial view. In the second phase, many authors tried to emphasise the integrative relationships downstream the agricultural production with food processing firms along all the filière production. Then, in the third phase, to a better understanding of the territorial articulation of the Italian agro-food system, it has been used instruments peculiar to the industrial economy, like the industrial districts, with a more systemic approach.

In these more recent line of research, some limit themselves have been underlined in the definition of the conditions allowing the existence of the industrial district in a Marshallian perspective. Other researchers get to a more detailed and diversified definition of the local system, according to the firms' characteristics and to the relationships established between them and/or with the external market [16][23].

The numerous works done, on agro-food districts in Italy up to now, have described the structure, the organisation and the functioning of a single local economy, without giving a general picture of complex and diversified reality existing in Italy [4][19][20][24].

The main purpose of this study is to single out the localisation, the concentration and the specialisation that take places in the agro-food industry on the national territory. This gives a first but complete element of knowledge, of the geographical distribution of agro-food industry that can be enriched later by further and deeper analysis, in order to verify the presence of the conditions allowing to identify these areas as local systems of agro-food production.

In our analysis we have used the data of 1991 Census of Industry, regarding the number of firms and establishments and the number of employees. We processed the data at a municipal level (for all the 8100 Italian municipalities) related to the establishments and their employees, as they characterise more precisely the presence on the territory of the processing activities. The availability of data at a municipal level represents an element of great relevance for trying to identify the agro-food districts. We have used the data for the manufacturing industry as a whole, as term of reference, and particularly that of the food sector, with three digits classification of the economic activities, that include nine sub-sectors which are: 15.1 Meat production, processing and preservation; 15.2 Processing and preservation of fish and fish by-products; 15.3 Fruit and vegetables processing and preservation; 15.4 Manufacturing of animal and vegetal fat and oils; 15.5 Dairy industry; 15.6 Grain and starch products processing; 15.7 Animal feed manufacturing; 15.8 Other food products; 15.9 Drink industry (in this paper we presents the result for only two main sectors 15.1 and 15.5).

The present work include a preliminary analysis of the importance of territory in the analysis of agro-food industry (paragraph 2), then, in paragraph 3, the results of concentration of the agro-food industry as a whole are presented. The paragraphs, 4 and 5, describe the specific results obtained in the identification of local systems of production for the dairy and meat sectors. In the last paragraph we draw some conclusions.

2. THE TERRITORIAL ANALYSIS OF THE AGRO-FOOD INDUSTRY

The traditional approach for analysing the agro-food industry doesn't highlight the complexity and the heterogeneity present in different areas of Italy. The analytic tools that consider the development of different territorial systems better contribute to the deepening of the analysis and

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to the understanding the different dynamics of different areas.

To improve the knowledge of the national agro-food system, it is important to have not only quantitative information about the different phases of the agro-food chain (*filières*), but also about the way in which the activities are distributed on the territory. This also is important to identify potential relationships existing at a local level between agriculture and food industry for the utilisation of the agricultural production in the industrial processing. In fact, the relationships between agriculture and processing industry are very different on the territory, with different degree of linkage and integration, according the different *filières*. In some cases the links are very tight, consequently with a decisive role played by the local agricultural production in the development of the processing activity. This has been originally the case for milk, beef and pork. In other cases the linkages are less straight, for instance in the confectionery industry whereas the linkages are often missing in the case of poultry slaughtering. Then, we must keep in mind that the relation primitively and frequently existing between agriculture and industry, which favoured the setting of the latter, changed with the opening of the agro-food system to the availability of raw materials coming from abroad and especially from EU countries.

The economic analysis progressively recognised the importance of the different regional outfits of social conditions, natural resources and institutional organisations. We drop the purely sectorial perspective and consider the variety of links between the different sector in a defined geographical space. This, according to Sabel [27], allows to identify the national development path as the summing up of many processes occurred at a local level. At the same time, however, it led to the increasing complexity of the interpretative patterns, because of the growth in the number of variables and interrelations to be considered, due to the “inter-sectoriality” of the links set at a local level.

The regional economics, to which the territorial analysis is strictly related, is consider the geographical space according to two typologies [12]. The first and most traditional one, where the geographical variable is independent, is fulfilled when the analysis sets *a priori* the observation’s territorial background, referring to the administrative divisions. The second one is based on the presence of intermediary territorial levels, where functional links appear between the economic agents. In this case the boundaries often do not fit the ones of the administrative regions. The geographical space is here a dependent variable. It is the result of interactions occurring between economic agents and creating an economic system, which is different from the addition of the single components representing the local system and which is set as a development alternative [29].

This study is at an intermediate level because we use statistical data corresponding to already defined geographical limits - municipalities -, just to find if the similarity conditions exist between municipalities of neighbouring areas, independently from their superior territorial unit (i.e. the provincial or regional system).

To detect the territorial systems of the food industry which will be described further, we took into account several variables starting with the importance they have at a national level, i.e. by the number of employees, the establishments structure, respect to the manufacturing industry as a whole. We also considered their role within the local economic system when, even not having a remarkable weight at a national level, the food industry represents a first-rate component of the local employment.

3. THE AGRO-FOOD INDUSTRY AS A WHOLE

In Italy, the agro-food industry as a whole is composed of more than 68,000 establishments employing 458,000 persons. Lombardia is the region which has the highest number of establishments in the food sector (more than 8,000 establishments and 75,000 persons employed) followed by Emilia Romagna. In the Southern Italy, the region with the highest number of establishments is Sicilia, 6,300, but it only employs 24,000 persons in the food industry, which is less than Campania, 30,000 and Puglia, 26,000 (table 3.1 and 3.2).

The agro-food industry is largely diffused in the national territory. About 7,000 municipalities out of 8,100 have a more or less important reality of agro-food industry. They are located for 33% in North-Western Italy, 19% are in North-Eastern Italy, whereas 24% in Southern Italy and 10% are located in the Islands. In 1991, considering the number of establishment about one was active in the Northwest and another quarter in the Northeast Italy. In the Southern area, was located another quarter whereas the Islands and the Centre together shared almost equally the remaining 25%. The percentage of food industry's employees, about 16% in the North area, on the all manufacturing industry, has double value in the others one areas especially in the South. This points out the different economic development between Northern Italy and Centre-Southern Italy. Often the agro-food industry is the only manufacturing industry in the Centre-Southern Italy and for this reason it has a higher weight in terms of employees and in terms of establishments.

The first impression of a vast dispersion on the national territory of the agro-food industry has to be reappraisal. In fact if we consider the geographical subdivision, according to the number of employees of the agro-food industry, we found that more than 50% of them are concentrated in less than 15% of the 7000 municipalities where the agro-food industry is located. Moreover, more than 21% of the total employment is localised in only 130 municipalities. The agro-food industry is concentrated in the North where there are more than 50% of the agro-food total employment. It is worth to underline that this high concentration exceeds the one of the manufacturing sector as a whole. The Italian agro-food industry is characterised both by the spread and concentration both by the existence of really small firms and small establishments. The average size is only 6.7 employment per establishment, with higher value in the Northwest (8.2), and the lower value in the South (3.8).

To represent the agro-food industry localisation and concentration we have utilise the traditional indexes described in the following pages. We didn't report these indexes because in this paper they are been used mainly for the identification of the local system of production which are described in the next paragraph (3 and 4). To give a first cartographic representation of the localisation of agro-food industry in Italy we have utilised the employment concentration index, which is the ratio between the number of person employed in the agro-food sector at the municipality level, and the total employees at national level. In the figure 3.1 we have represented the municipalities, where the index exceeds the threshold value of $\frac{1}{2}$. These municipalities are only 129, less than 2% of municipalities where is localised some food industries, but they have over 14,000 establishments (20% of the total) and over 160,000 employees in the food industry (35% of total). In these municipalities the employees in the food industry is on average the 13% of the employees in the manufacturing industry as a whole. The average size of the agro-food establishment in these municipalities is more than 11 employees, with higher value in the North (13-

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14 employees per establishment). The figure 3.1 show a “mosaic” type of distribution of municipalities with main concentration in the North of Italy and especially in Emilia Romagna.

In a reality where the agro-food industry is at the same time spread and concentrate at territorial level, the identification of the agro-food districts appears like being particularly complex. In fact the high concentration of firms in some regions leads to the superimposition and the intersection of very different realities which are very hard to isolate. On the other hand the identification of the districts is also very hard to be executed because of the difficulties to obtain other social and economic indicators at municipalities level. Furthermore in Italy, the criteria to localise and quantify the industrial districts contained in the law 317/93³, are impossible to be utilised in the agro-food system.

In our work we have tried to identify the territorial systems in the agro-food sector thanks to six indexes calculated on the base of 1991 Census of Industry data. We utilise municipal data, about the food and manufacturing industries, as a whole, but also data about the resident population from 1991 Census of Population. The indexes are:

- ?? the firms' localisation index (I_1),
- ?? the employment localisation index (I_2),
- ?? the firms' concentration index (I_3),
- ?? the employment concentration index (I_4),
- ?? the firms' localisation index according to the agro-food sector (I_5),
- ?? the employment localisation index according to the agro-food sector (I_6).

The first four indexes were calculated comparing the food sector to the manufacturing sector as a whole we can say that the first two indexes indicate the localisation of food industry, respect to its importance on the population of each municipalities. The indexes 3 and 4 indicate the concentration of food industry respect the manufacturing industry whereas the indexes 5 and 6 indicate the specialisation of each agro-food sector respect to the agro-food sector as a whole. Then, each indicator was transformed into a dichotomical variable in order to obtain six *dummy* variables for each municipality. The 0 value may be obtained by an observed municipality if no indicator passed the θ_{is} threshold, whereas the 1 is obtained if the indicator exceed the above-mentioned threshold. For more details, please refer to Brasili, Pecci, Giustino [7].

³ This law gives incentives to restructuring the industrial district in crisis. Please refer to Carboni [10] who, using the 317/93 law criteria, individualised and quantified the Italian industrial districts. These are highly concentrated in the North-East (one third of the industrial districts and 38% of their employees are in this area). It is followed by the Central and the North-Western areas (about 30% each), whereas only 7,5% of the Italian districts and 3% of the personnel they employ are situated in the South.

Table 3.1 – Area districts share of firms and establishments of the Manufacturing industry as a whole and of the Food industry

Area	Population	Manufacturing industry				Food industry				Employees Food ind (b/a %)
		Firms	Firms' employees	Establish.	Establish. employ. ^a	Firms	Firms' employees	Establish.	Establish. employ. ^b	
Northwest	14950859	176853	2334177	190383	2091576	14428	146684	15794	129457	6,2
Northeast	10378335	139065	1357854	148998	1383450	13727	133296	15275	134916	9,8
Centre	10911353	116201	900577	124256	920170	9761	68968	10956	72318	7,9
South	13922850	84979	512867	90987	638166	16108	82988	17625	87235	13,7
Islands	6614634	35240	157093	38129	194187	7883	34223	8661	34869	18,0
ITALY	56778031	552338	5262568	592753	5227549	61907	466159	68311	458795	8,8

Source: ISTAT: Census of Industry, 1991; our processing.

Tab. 3.2 – Employment concentration index by Food industry; municipality where the index exceeds the value of (? ? ??), per area

Area	Municipality	Population	Manufacturing industry			Food industry			Employees Food ind. (%)
			Establish.	Employees	Empl./Establish.	Establish.	Employees	Empl./Establish.	
Northwest	35	4122132	38275	464458	12,1	3231	46277	14,3	10,0
Northeast	45	3404670	35504	343344	9,7	4261	55824	13,1	16,3
Centre	20	4344263	30858	246755	8,0	2601	29572	11,4	12,0
South	20	2743816	16673	151760	9,1	2296	19463	8,5	12,8
Islands	9	1853952	10687	56567	5,3	2054	9794	4,8	17,3
TOTAL ITALY	129	16468833	131997	1262884	9,6	14443	160930	11,2	12,7

Source: ISTAT, Census of Industry, 1991; our processing.

4. THE TERRITORIAL SYSTEMS OF THE DAIRY INDUSTRY IN ITALY

4.1 Localisation in the main geographical areas

In Italy there are 1991 municipalities with milk processing establishments, with a total of 4,847 establishments and 49,030 employees (tables 4.1a and 4.1b) with a wide diffusion on the national area. The average size of the establishments in the milk sector is very small: 10 employees per establishment. Analysing deeply the figures, we can see that the municipalities with establishments of more than 10 employees drop to less than half: 810 municipalities but with 3,258 establishments and 44,505 employees (over 90% of the total). Moreover, the municipalities with more than 50 employees per establishments are only 188 and they have 1,518 establishments and 31,433 employees (64% of the total). These figures show that the milk sector despite the wide spread is really in few municipalities.

The milk processing industry is concentrated in the Northwest of Italy with more than 35% total employees. In this area the major average size, of the establishment it is more than 17 employee. The municipalities interested in this area are 534 with 33 employees each ones. In the Northeast area there are about 29% of total employees of the dairy industry, but in this area the average size decrease to 7.4 only employees per establishment (less than half respect to the Northwest). Beside in the Northeast there is a large diffusion on the territory of the dairy industry, in fact the municipalities involved increasing to 644. In the South and the Islands of Italy the milk processing establishments are much less important (20% of the employees) and they have the same average size of Northeast. In the Centre the dairy industry have only 11% of the total employees but the few establishment present in this area have an average size value similar to Northwest one (16.5).

Utilising the localisation, the specialisation and concentration indexes, presented in the previous paragraph, the milk processing industry, show that only 237 municipalities have a synthesis index higher than 4. The milk processing establishments involved are 1,250, the 26% of the total, and 14,500 employees, the 30% of the Census value. The employees' rate of the dairy sector with respect on the all employees of the agro-food industry, is very different at regional level. In the Northwest there is the highest value, 74%; it means that, the dairy industry is both concentrated and really important in the local economies' system, together of being of big establishments. Indeed in the other areas the specialisation' figures are lower, about 50%. The average size of establishment specialised in dairy industry is much more high: in Northwest is about 27, in the Centre decreases to 21 and it is lesser in the other areas.

4.2 The main systems of processing milk

For identifying the localisation of the main systems of production of dairy industry we have used the synthesis index, as we have explained before. The municipalities with a synthesis index higher than 4 are over 270 municipalities and they have several degrees of uniformity, but different structural characteristic. Among these municipalities we have found 18 local systems specialised in processing milk (Tab. 4.2). In defining the boundaries of each local system, we have included the municipalities which had the administrative boundaries with an high degree of contiguity (in the geographical meaning). In few specific situations we have included municipalities which have

synthesis index less than 4, because they were among other with high level of specialisation. These municipalities were included only when they have an important weight in terms of employees, with respect to the main characteristic of the observed local system.

In the less favourite areas, like mountains areas or Southern regions and Islands, the conditions of existence of the local agro-food system are more weakly linked to the synthesis index. In these areas the dairy industry is an important reference point for the economic development, also if they have a limited importance in term of employees and nevertheless the small size. The local systems, identified through this methodology, specialised in milk processing, involve in total 1,594 establishments with 25,024 employees, that represent the 33% and 51% of the of dairy industry.

The most important local systems are in the Po Valley. In the upper Lombardia region there are two smaller systems, one in the province of Varese and one in the province of Como, where there are 700 employees in the dairy industry, and the average size is more than 40 employees per establishment. These two systems involve only few municipalities, but they substantially differ in the fact that the dairy industry has about 50% of employees of food industry in the province of Varese, whereas they are about 95% in the province of Como. The third system in the medium-upper Po Valley is much more important. This system is located just at North of the Po river it is interesting all the Lombardia's provinces between Milano and Mantova, the *continuum* in this system is assured by the high specialisation in the dairy sector. In this system we have included some non contiguous municipalities. There are 34 municipalities in 6 provinces; with 14 establishments and more than 7,800 employees. The average size of the establishments is really high, 55 units, with respect to the rest of dairy industry. Milano, chief town in the region, is involved in this system with 2,400 employees and average size of 60 employees per establishment (the Milan employees in this sector is about a quarter of total food industry). This local system has an advanced productive structure and it has an important role and weight in the Italian economy. The main product of this local system is the Grana Padano who has great importance in the Italian cheese production.

Immediately under the Po river there is the other important system of production that involved the widest geographical area between Lombardia and Emilia Romagna regions. In the extreme points there are (from Cremona province to Bologna province). The system interests are 7 provinces and 113 municipalities. This system has 7,700 employees and 900 establishments. The establishments structure and the specialisation degree are very different in this area. The municipalities of the provinces of Cremona, Mantova and Piacenza have a higher specialisation level with respect to the municipalities of the other provinces; moreover Cremona has the major average size, 34 employees per establishment, immediately after Bologna has the average size 28 and much more less Piacenza with 11 employees per establishment. In the other provinces the average size is much lower. On one hand these differences are linked to the particular structure of the dairy industry devoted to the production of one of the most typical cheese of Italy, the Parmigiano cheese who is still produced with a very tight rule of production and with handicraft process. In fact in this area the average size of the establishment are less than 10 units.[4][18]. On the other hand there are in the same area several important industries, for example meat industry, localised in the same provinces mainly in Emilia Romagna region.

In the last case the dairy industry, although relevant in the local context, has secondary importance. In fact in all the Emilia' provinces, except Piacenza, the rate of dairy sector in the all food industry is low and it varies from a maximum figure, 24%, in the municipalities of Reggio

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Emilia's province to a minimum figure, 14%, in the municipalities of Modena' province, but there are a wide number of establishments and employees. The same minor levels of specialisation, also in this with is the Parmigiano-Reggiano cheese production, involved all the north-east regions, where the dairy industry has a wider diffusion but an inferior structure with respect of North-western area.

Tab. 4.1a – Municipality with dairy industry. Establishments and employees in the Manufacturing, Food and Dairy industry, per great area (absolute values)

Area	Municipality	Population	Manufacturing		Food		Dairy	
			Establish.	Employ.	Establish.	Employ.	Establish.	Employ.
<i>Northwest</i>	534	8191466	94282	1069147	8240	78203	988	17113
<i>Northeast</i>	644	7571690	102557	970699	11336	98399	1925	14181
<i>Centre</i>	189	6944558	67465	506087	5803	45511	336	5545
<i>South</i>	476	9395695	59929	443410	10517	58815	1222	9426
<i>Islands</i>	148	3372407	20314	103864	4305	20186	376	2765
<i>ITALY</i>	1991	35475816	344547	3093207	40201	301114	4847	49030

Source: ISTAT, Census of Industry, 1991; our processing.

Tab. 4.1b – Municipality with dairy industry. Establishments and employees in the Manufacturing, Food and Dairy industry, per great area (percentage values)

Area	Municipality	Population	Manufacturing		Food		Dairy	
			Establish.	Employ.	Establish.	Employ.	Establish.	Employ.
<i>Northwest</i>	26,8	23,1	27,4	34,6	20,5	26,0	20,4	34,9
<i>Northeast</i>	32,3	21,3	29,8	31,4	28,2	32,7	39,7	28,9
<i>Centre</i>	9,5	19,6	19,6	16,4	14,4	15,1	6,9	11,3
<i>South</i>	23,9	26,5	17,4	14,3	26,2	19,5	25,2	19,2
<i>Islands</i>	7,4	9,5	5,9	3,4	10,7	6,7	7,8	5,6
<i>ITALY</i>	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: ISTAT, Census of Industry, 1991; our processing.

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Tab.4.2 - Local Systems processing milk

System	Province	Municip.	Popul..	Manufacturing			Dairy			Food			Emp. Food. /Manuf. (%)	Emp. Milk /Food (%)
				Estab..	Employ.	Emp./Est.	Estab..	Employ.	Emp./Est	Estab..	Employ.	Emp./Est		
BALOCCO-BURONZO	VERCELLI	4	3524	66	1017	15,4	7	169	24,1	11	179	16,3	17,6	94,4
CAMERI-NOVARA-ROBBIO	NOVARA	9	129108	1097	16344	14,9	43	665	15,5	137	2420	17,7	14,8	27,5
	PAVIA	1	6414	78	1419	18,2	1	146	146,0	12	323	26,9	22,8	45,2
	TOTAL	10	135522	1175	17763	15,1	44	811	18,4	149	2743	18,4	15,4	29,6
CARAMAGNA-CAVALLERMAGGIORE	CUNEO	4	31308	365	6921	19,0	17	424	24,9	58	761	13,1	11,0	55,7
AOSTA	AOSTA	6	3920	51	303	5,9	10	92	9,2	14	107	7,6	35,3	86,0
TRAVEDONA-MONATE-VARESE	VARESE	4	92587	1075	12252	11,4	9	404	44,9	83	853	10,3	7,0	47,4
INTROBIO	COMO	3	5354	97	789	8,1	8	306	38,3	13	324	24,9	41,1	94,4
MEDIA PIANURA LOMBARDA-MILANO	MILANO	7	1563944	16143	169920	10,5	67	3353	50,0	899	11552	12,8	6,8	29,0
	BERGAMO	3	40716	698	7985	11,4	6	635	105,8	54	894	16,6	11,2	71,0
	BRESCIA	7	56350	1111	9995	9,0	25	432	17,3	94	862	9,2	8,6	50,1
	PAVIA	4	12822	118	1832	15,5	4	1417	354,3	20	1487	74,4	81,2	95,3
	CREMONA	6	26981	381	3616	9,5	10	1202	120,2	91	1674	18,4	46,3	71,8
	MANTOVA	7	64000	844	9367	11,1	29	748	25,8	122	1616	13,2	17,3	46,3
	TOTAL	34	1764813	19295	202715	10,5	141	7787	55,2	1280	18085	14,1	8,9	43,1
	BASSA PIANURA-BASE APPENNINO (LOMBARDIA and EMILIA)	CREMONA	5	21588	320	2930	9,2	8	270	33,8	48	537	11,2	18,3
	MANTOVA	8	59941	1014	9165	9,0	56	528	9,4	177	1290	7,3	14,1	40,9
	PIACENZA	10	49506	583	4887	8,4	44	499	11,3	103	1054	10,2	21,6	47,3
	PARMA	26	320929	5155	46912	9,1	337	2996	8,9	1156	12885	11,1	27,5	23,3
	REGGIO E.	33	368589	7089	64174	9,1	260	1790	6,9	847	7271	8,6	11,3	24,6
	MODENA	25	435763	9350	85368	9,1	173	996	5,8	808	6757	8,4	7,9	14,7
	BOLOGNA	6	462200	4981	45052	9,0	23	636	27,7	404	3911	9,7	8,7	16,3
	TOTAL	113	1718516	28492	258488	9,1	901	7715	8,6	3543	33705	9,5	13,0	22,9

following tab. 4.2)

System	Province	Municip.	Popul..	Manufacturing			Dairy			Food			Emp. Food /Manuf. (%)	Emp. Milk /Food (%)
				Estab..	Employ.	Emp./Est	Estab..	Employ.	Emp./Est	Estab..	Employ.	Emp./Est		
TRENTINO-CLES	TRENTO	5	10413	142	1071	7,5	5	174	34,8	17	236	13,9	22,0	73,7
ASIAGO (TRENTO E VICENZA)	ASIAGO	3	14434	193	1285	6,7	7	117	16,7	30	191	6,4	14,9	61,3
ALTA PIANURA VICENZA and PADOVA	VI and PD	6	22800	519	5203	10,0	20	217	10,9	43	331	7,7	6,4	65,6
	TOTAL	9	37234	712	6488	9,1	27	334	12,4	73	522	7,2	8,0	64,0
VENETO ORIENTALE - FRIULI	TV and VE	6	26612	444	4546	10,2	21	408	19,4	57	775	13,6	17,0	52,6
	UDINE	6	20691	259	3544	13,7	22	326	14,8	44	415	9,4	11,7	78,6
	TOTAL	12	47303	703	8090	11,5	43	734	17,1	101	1190	11,8	14,7	61,7
CISTERNA DI LATINA - PONTINIA	LATINA	5	104243	853	18372	21,5	13	700	53,8	107	3120	29,2	17,0	22,4
FERENTINO	FROSINONE	6	119613	856	13212	15,4	14	644	46,0	104	1102	10,6	8,3	58,4
MOLISE	CB-IS	9	71622	484	4247	8,8	33	613	18,6	119	2097	17,6	49,4	29,2
MARCIANISE-S. MARIA A VICO	CASERTA	9	167211	883	13436	15,2	51	1521	29,8	148	2895	19,6	21,5	52,5
SOMMA VESUVIANA	NAPOLI	3	68595	331	1811	5,5	11	225	20,5	80	396	5,0	21,9	56,8
VICO EQUENSE-AGEROLA-EBOLI	NAPOLI	6	141454	816	6103	7,5	79	383	4,8	254	1312	5,2	21,5	29,2
	SALERNO	6	304958	1998	15527	7,8	57	417	7,3	332	2337	7,0	15,1	17,8
	TOTAL	12	446412	2814	21630	7,7	136	800	5,9	586	3649	6,2	16,9	21,9
SALA CONSILINA	SALERNO	4	26111	216	659	3,1	14	103	7,4	51	181	3,5	27,5	56,9
	BASILICATA	2	10235	64	152	2,4	5	16	3,2	19	40	2,1	26,3	40,0
	TOTAL	6	36346	280	811	2,9	19	119	6,3	70	221	3,2	27,3	53,8
CONVERSANO-GIOIA DEL COLLE	BARI	6	132242	1358	9394	6,9	59	874	14,8	242	2128	8,8	22,7	41,1
LOGUDORO-ANGLONA-MARGHINE	SASSARI	11	49367	395	1494	3,8	35	455	13,0	116	779	6,7	52,1	58,4
	NUORO	2	11981	100	1159	11,6	11	123	11,2	31	283	9,1	24,4	43,5
	TOTAL	13	61348	495	2653	5,4	46	578	12,6	147	1062	7,2	40,0	54,4
TOTAL ITALY		274	5058126	60527	601463	9,9	1594	25024	15,7	6945	7537	10,9	12,5	33,2

Source: ISTAT, Census of Industry, 1991; our processing.

Typical and traditional productions:

Rural effect and agro-industrial problems

52nd EAAE Seminar - Parma, June 19-21 1997

5 THE TERRITORIAL SYSTEMS OF THE MEAT INDUSTRY IN ITALY

5.1 Localisation in the main geographical areas

The meat's sector in Italy has 5056 establishments and more than 59500 employees, they are 7.4% of food industry's establishments and 13% of the food industry's employees respectively (tables 5.1a and 5.1b). The establishments and the employees have a very different spatial distribution. In the Northwest area there are 38% of the establishment and roughly the 45% of the employees, whereas in the Northeast there are the 24.4% of the establishments and the 28% of the employees. Then the meat processing industry is mainly concentrated in the North of Italy. The sector average size is enough low, it is about 12 employees per establishment in all Italy and it is a few higher in the North only. Utilising the localisation, specialisation and concentration indexes of the processing meat industry we have underlined about 150 municipalities belonging to the local systems. In the map (graph. 5.1) we can see that only 26 municipalities (black colour) respect all the criteria used for the six indexes, then overcoming the average plus standard error threshold value. The greater part of these municipalities are not "alone", but they have a small area around of contiguous municipalities that respect a high number of criteria (4 or 5). These are represented in the map by blue and dark blue colours. There are also other municipalities, which have a lower value of synthetic index and however for contiguity and territorial reason we may include in the nearest local system.

Throughout this methodology we have identified in Italy ten territorial systems in which the processing meat industry is important and it has a relevant weight as employees' and establishments' number with respect the all food industry. These systems are particularly in few municipalities and we can identify them inside one or maximum two contiguous provinces. These territorial system for meat transformation industries are: the Parma's and Reggio Emilia's system, the Modena's system, the Cremona's system, the Mantova's system, the Verona's system and other five minor systems. These main territorial systems are manly located in the Northern part of Italy, in the Po Valley.

Tab. 5.1a Establishments and employees in the Manufacturing, Food and Meat industry, per area (absolute values)

Area	Municipality	Population	Manufacturing		Food		Meat	
			Establish.	Employ.	Establish.	Employ.	Establish.	Employ.
Northeast	662	8677136	105511	1180108	15794	129457	1232	16772
Northwest	603	7507967	104723	983625	15275	134916	1925	26635
Centre	400	8607534	97218	722174	10956	72318	868	9119
South	463	7611523	51817	378295	17625	87235	705	5660
Islands	233	4205784	24978	131600	8661	34869	326	1409
Italy	2361	36609944	384247	3395802	68311	458795	5056	59595

Source: ISTAT, Census of Industry 1991; our processing.

Tab. 5.1b Establishments and employees in the Manufacturing, Food and Meat industry, per area (percentage values)

Area	Municipality	Population	Manufacturing		Food		Meat	
			Establish.	Employ.	Establish.	Employ.	Establish.	Employ.
Northeast	28,0	23,7	27,5	34,8	23,1	28,2	24,4	28,1
Northwest	25,5	20,5	27,3	29,0	22,4	29,4	38,1	44,7
Centre	16,9	23,5	25,3	21,3	16,0	15,8	17,2	15,3
South	19,6	20,8	13,5	11,1	25,8	19,0	13,9	9,5
Islands	9,9	11,5	6,5	3,9	12,7	7,6	6,4	2,4
Italy	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: ISTAT, Census of Industry, 1991; our processing.

The local systems of the food industry in Italy

Tab. 5.2 – Local system processing meat

System	Province	Municip.	Popul.	Manufacturing			Meat			Food			Emp. Food.. /Manuf. (%)	Emp. Meat. /Food (%)
				Estab.	Employ.	Emp./Est.	Estab.	Employ.	Emp./Est.	Estab.	Employ.	Emp./Est.		
PARMA REGGIO EMILIA	PARMA	15	243946	3845	35951	9,4	443	3769	8,5	901	11169	12,4	31,1	33,7
	REGGIO E.	7	183612	3062	26984	8,8	73	837	11,5	416	4503	10,8	16,7	18,6
	TOTAL	22	427558	6907	62935	9,1	516	4606	8,9	1317	15672	11,9	24,9	29,4
MODENA	MODENA	14	290001	45822	4782	1,0	187	3795	20,3	623	6627	10,6	14,5	57,3
CREMONA	CREMONA	23	168578	1934	20655	10,7	133	2246	16,9	301	4926	16,4	23,8	45,6
MANTOVA	MANTOVA	6	34975	644	6623	10,3	31	1147	37,0	100	1527	15,3	23,1	75,1
	REGGIO E.	2	10905	259	2178	8,4	6	228	38,0	26	330	12,7	15,2	69,1
	TOTAL	8	45880	903	8801	9,7	37	1375	37,2	126	1857	14,7	21,1	74,0
VERONA	VERONA	9	306385	3139	36352	11,6	36	2612	72,6	322	5957	18,5	16,4	43,8
ROMAGNA	FORLÌ	6	222722	3040	23885	7,9	36	1890	52,5	330	4245	12,9	17,8	44,5
NORCIA	PERUGIA	3	9025	77	287	3,7	18	130	7,2	30	182	6,1	63,4	71,4
	MACERATA	1	1331	21	98	4,7	4	20	5,0	11	84	7,6	85,7	23,8
	TOTAL	4	10356	98	385	3,9	22	150	6,8	41	266	6,5	69,1	56,4
ALTO ADIGE - VAL PUSTERIA	BOLZANO	6	17728	167	1023	6,1	18	163	9,1	34	351	10,3	34,3	46,4
	BOLZANO	4	13192	123	1264	10,3	18	177	9,8	27	228	8,4	18,0	77,6
	TOTAL	10	30920	290	2287	7,9	36	340	9,4	61	579	9,5	25,3	58,7
SAN DANIELE	UDINE	1	7439	141	1277	9,1	35	430	12,3	48	504	10,5	39,5	85,3
TOTAL ITALY		97	1509839	21178	161359	7,6	1038	17444	16,8	3169	40633	12,8	25,2	42,9

Source: ISTAT, Census of Industry, 1991; our processing

5.2 The territorial system of Parma and of Reggio Emilia

The territorial system of Parma and Reggio Emilia is the largest Italian meat system. There are 8 municipalities in Parma, which respect all the criteria, and other 7 municipalities of Parma province and other 7 municipalities of the Reggio Emilia which respect 4 or 5 criteria. This system is characterised by roughly 516 establishments and by 4606 employees. A quarter of employees, about 1200, are concentrated in municipality of Langhirano, this figure represents about the all employees (95%) of the agro-food industry in this municipality, and the 65% of the manufacturing industry. There are other two municipalities in Parma province in which the meat sector has a relevant weight: Felino has 545 employees and 46 establishments, Lesignano de Bagni has 363 employees and 39 establishments.

This system is characterised mainly in the processing pork meat. The most important product is Parma ham, and it has seasoned for 12 months in the warehouses of Langhirano. The meat sector in the chief towns, Parma and Reggio Emilia, has the low importance with respect to the all food industry. In fact Parma has the 7.8% and Reggio Emilia has the 11.2% of establishments in the meat sector. Their weights in terms of employment is yet less relevant then for the number of establishments. We have included these two chief towns in the local system for their intense relationship with the other food industry's sector but they are surely not the kernel of the system.

The average size of the local system is really small, only 9 employees per establishment. Only two municipalities, Busseto and Busana, have average size respectively of 60 and 97 units but they have few establishments.

5.3 The territorial system of Modena

In the territorial system of Modena there are about 14 municipalities, all of them in Modena province, with 3797 employees and 187 establishments in the meat sector. The municipality of Castelvetro di Modena (which respect all the criteria) has 990 employees and 38 establishments, on a population of Castelnuovo Rangone and Spilamberto, together to Castelvetro di Modena, are the *kernel* of this productive system ,where there is one of the most important processing meat company, that is the "Cremonini Group". The chief town of Modena has been included in this system because the 33.7% of the agro-food employees work in the meat sector. In this system, the average size is 20 employees per establishment, this value is roughly the double with respect to the system of Parma and Reggio Emilia. The typical production of this system is not only ham but also many type of salami and pre-cooked pork products. The Modena province is the one of the most important meat exporter that is confirm the role of leader of this local system.

5.3 The territorial system of Cremona

There are about 20 municipalities in the system of Cremona, they have 133 establishments and 2246 employees. The system is localised from Northwest to Southeast following the administrative boundaries pattern of the province. The meat sector both in terms of employees and of establishments, is more concentrated in the Northern municipalities of the province (Pandino, Spino d'Adda, Dovera, Gadesco, Vescovato, Rivolta D'Adda). The meat sector

in this municipalities, has an higher weight (44%), with regard to the food industry, both in terms of employees and in terms of establishments. The average size is about 17 employees per establishment that is higher than the national level. The province of Cremona is one of the principal meat exporter.

5.4 The territorial system of Mantova

This system is about completely included in the administrative boundaries of the Mantova province. It consists of 8 municipalities and has only 37 establishments and 1375 employees. The meat sector's specialisation is very high: there is the 74% of employees with regard to the all food sector. In only three municipalities, Viadana, Dosolo and Poviglio, there are concentrated the 78.4% of the establishments but an high numbers of employees (711). The average size in this 3 municipalities is about 90 employees per establishment. This local system does not have a lot of weight in terms of establishments and of employees but it is important because it include the main slaughtering establishment.

5.5 The territorial system of Verona

The system localised in the province of Verona is characterised by 9 municipalities. Two of these municipalities, Nogarole Rocca and San Martino B. A., have a very important role in the meat sector: they have 6 establishments and 2336 employees which represent the 16.7% of the establishments and about 90% of the employees, in the local system, respectively. Therefore, there are few big companies in this area, particularly in the poultry sector [23]. The productive specialisation in the meat sector is not particularly high, in fact, only the 11.2% of the establishment and the 43.8% of the employees are in the meat sector with respect to all the agro-food industry.

6. Concluding remarks

This work highlight the large diffusion of food industries at municipality level, but at the same time it show the presence of important areas with a strong concentration of processing agro-food industries both in general and in two specific sectors (dairy and meat). This is the first step toward the identification of the presence of local system, organised and characterised by specialisation of the production and by the concentration of the establishments and of the employees in few municipalities.

The results of our analysis, both for all the food industry and for the milk and meat sectors, show that the traditional view of wide diffusion of presence on the national territory of food industries, can be substitute by an image of high spatial concentration with the presence of a "mosaic" distribution of the main local system of production. In these areas each specific food industry sector has a great importance regards the employees and establishments, of the all food industries at municipality level underlying the high degree of specialisation. The presence of the small and medium-size establishments and firms characterises in different way each local system.

The future work will require the application of new statistical methodology, as spatial

correlation analysis and “fuzzy” cluster analysis, for a better identification of local systems of production in the food industry at municipality level.

The results suggest to pay more attention to the concentration and specialisation areas in order to deeper the analysis on the organisation and characteristics of each local system. In particular it is necessary to analyse each local system in terms of weight in local economy, in terms of economic competitiveness, in terms of links with the local socio-economic characteristics, and in particular, in terms of degree of their integration with the agriculture. To achieve this objective we will need to use more desegregated information for the food industry's sectors and to make local surveys.

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