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Milk Production Systems and Extension Work: Promoting a Dynamic Local Management of Collective Milking Parlours

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Abstract

The paper describes an action-research project involving milk producers in the Trás-os-Montes and Alto Douro region, Northern Portugal, who fall between the low-input to traditional agriculture. The major concerns of the study were 1 to compare farm production systems in the area, in order to understand their global functioning and environmental impact, (2) to identify major bottlenecks for the improvement of quality in small scale milk production, and (3) to test the potential of participatory extension work involving quality milk production, leading to new ways of managing problems and change in rural areas. The project demonstrated that there was a broad field for extension work, focused on such matters as animal management and hygiene, with potential positive impacts in terms of milk quality, and better income and quality of life for small farmers. This will help maintain populations in the rural areas, avoiding further desertification, and preserve the environment which has been sustained through the existing low-input and traditional farming systems.

Introduction

This paper presents the major outcomes of an action-research project on milk production systems and extension in the high mountainous valleys of northern Portugal. The major objectives of the project were: (1) to compare farming production systems in the area, in order to understand the global functioning and environmental impact of family farms while empasizing milk production practices; (2) to identify major bottlenecks for the improvement of quality in small scale milk production; and (3) to test the potential of participatory extension work involving quality milk production, leading to new ways of managing problems and change in rural areas.

The project was developed over a period of 28 months, by a mixed team of university researchers, trained in animal production and the social sciences, in close collaboration with the Cooperative Dairy Union (AGROS), the Regional Directorate of Agricultural Services, the local Animal Health and Hygiene Association, and the users and operators of two village Collective Milking Parlours (CMP).

In theoretical terms, this research was inspired by such views as "participatory agricultural research" (Farrington and Martin, 1993) and the approach developed by GERDAL in France, based on action-research with farmer groups to strenghten the exchange of ideas between farmers and researchers and stimulate innovation at the local level (Darré, 1994, Ruault, 1994). In general terms, the work involved rapid appraisal procedures, in-depth interviews,

extensive field visits, multiple meetings with farmers and technicians, and use of laboratory facilities and tests for assessment of animal health linked to milk quality.

The Area, Milk Production and Production Systems

Farming, and milk production in particular, is the main activity in the area

The studied area corresponds to the counties of Chaves and Vila Pouca de Aguiar, in the interior North of Portugal. It is a mountainous area, with altitudes ranging between 400 and 1,200 m. The climate is Sub-Atlantic, with long and cold Winters, and late frosts. Most soils are acidic and have a low level or organic matter, factors which limit agricultural production.

The population in the area has been decreasing (-30% between 1960 and 1991) and growing older (the proportion of individuals with more than 65 years has passed from 11% of the population in 1981 to 15% in 1991; INE, 1981, 1991). The active population is distributed differently in the two counties. In Chaves, agriculture and other primary sector activities occupy 19% of the population, while in Vila Pouca de Aguiar, such activities occupy 41%. The farming population has been decreasing, especially in Chaves, due to emigration and transfer to other economic activities, mainly services. However, the evolution of industry and services has not lead to major changes in the medium term. In this sense, agriculture will continue to have an important role, to capture labour and generate income.

Farms are generally small and very fragmented, with predominately non-irrigated crops, associated to a dual-purpose cattle production system. The farming systems emphasize an approach which has little or no chemical inputs. This alternative approach includes crop rotations and use of animal manures that add nutrients and increase soil health. The production systems preserve the environment and contribute to improving the soils, which has been corroborated in a study on the effects of manuring in a neighboring municipality (Portela *et al*, 1994).

Agricultural land is mostly cultivated in cereals (53%), followed by potatoes and forage crops, each making up about 23% of the tillable area. In the last decades, the area of cereals and potatoes has been decreasing, and forage increasing, especially in Vila Pouca de Aguiar (INE, 1989). Local livestock breeds (*Maronesa* and *Barrosã*) were replaced, in the last twenty years, by milk cattle. Between 1979 and 1989 the number of milk cows grew approximately 60% (from 2619 to 4190).

Concerning milk production, most producers (67%) and animals (46%) correspond to farm holdings with less than 10 ha, which include about 32% of the dairy herd. About 94% of the producers and 81% of the herd are in farms with less than 20 ha. The average number of milk cows per holding falls within a average of three.

Table 1. Farms and dairy herd according to size/classes

Size/Class	Nº of Farmers	Nº of Animals	Animal/Farm	% of Animals
0<AA<5	372	610	1,6	14,6
5=AA<10	600	1332	2,2	31,8
10=AA<20	404	1461	3,6	34,9
AA>20	78	787	10,0	19,0
TOTAL	1454	4190	2,9	100,0

AA-Agricultural Area
Source: INE (1989)

Both the size of the dairy herd and milk production increased substantially in the last few years, particularly in the late 80's, with the implementation of EU milk quotas in Portugal. Two major focuses contributed to such growth, both at the individual and institutional level. On the individual side, the incentives included better incomes, stable markets and the monthly milk check. On the institutional side, there is a network of 33 Collective Milking Parlours scattered throughout the area, the construction of an industrial dairy processing plant and financial incentives provided by the EU and the government, which stimulated investment in milk production (through highly productive animals, animal housing, and equipment).

The Cooperative Dairy Union is the major actor in the milk chain and most production is collected at the village CMP

In the studied area, milk is collected by two enterprises, the Cooperative Dairy Union (AGROS) and Lacto Ibérica, a private dairy industry. Of the total milk produced in 1995 (20 million litters), AGROS collected 70% and Lacto Ibérica the remaining 30%.

The milk collected by AGROS comes from CMP users and producers with individual milking and refrigeration equipment (PMRS). The average production collected in CMP doubled between 1990 and 1995 (from 153 to 328 tones). This is mainly due to the transfer of producers from Lacto Ibérica to the network of CMP, and the closing of some CMP for inadequate production reasons.

The number of PMRS, major beneficiaries of the EU funds (797 Regulation), increased from 9 to 30 between 1989 and 1996, that was an annual growth of 3 units. The average amount of milk collected for such producers was, in the best year, 122 metric tons, that was 3 times less then the average production of the CMP.

Table 2. Number of parlours and average production by parlour between 1989 and 1992

Year	Collective Parlours			Individual Parlours		
	Nº	Production	Average Production (t)	Nº	Production	Average Production (t)
1989	33	1656,6	50,2	9	—	—
1990	35	5383,0	153,8	16	532,8	33,3
1991	36	6487,2	180,2	22	2574,0	117,0
1992	34	6820,4	200,6	26	3171,9	121,9
1993	34	6160,0	189,0	27	2905,2	107,5
1994	33	10091,0	305,8	30	3065,1	102,1
1995	32	10568,0	328,2	30	3441,2	114,0

Source: AGROS (1995)

CMP producers have small herds and dual-purpose cow production systems are dominant

Given the importance of CMP producers, the project aimed at studying their production system and farming practices. Two villages were selected and 17 milk farmers visited, interviewed, and as well as later being included in other project activities.

Data analysis showed the existence of two major types of farmers, we called „modernised“ and „traditional“. What distinguishes them is that the first produce silage, have a bigger herd, larger holdings and better education and training.

All farms are family operated and producers have an average age of 48 years. The use of paid labour is rare and not significant, predominating are family work and mutual help arrangements. The "modernised“ holdings have an average size of 13,5 ha, and the traditional ones about 9 ha. While "traditional“ producers own most of the land, the "modernised“ only own 21%, with most land being rented. The land is intensively used and the area of forages has been expanded. "Traditional“ farmers produce a wider variety of crops (rye, corn, and potatoes), and forage only occupies 23% of the land. The "modernised“ are more specialised, and forage occupies about 80% of the farm. The degree of farm mechanisation is generally low, but the use of equipment is high, given the existence of rental systems, as well as of exchange schemes between families.

Farmers are strongly oriented towards milk production, on the base of a relatively young herd, and such activity is the major income source for both types of producers. The increases in the number of milk cows has been gradual and only the "modernised“ present considerable increases, as well as highly productive animals. All farms have traditional farm facilities. Concentrate, hay and permanent pasture grass constitute the basic feed of milk cows in the case of the "traditional“ producers. The "modernisers“ add silage to this menu. Both types of producers identified, as the major problems, mastitis and bruceloses.

All the indicators support the importance of the CMP for the area, not only in the structure of the Cooperative Dairy Union, but also for the preservation and development of the small farmers production system, which is vital to avoid further population decline and preserve the rural environment However, such importance has not corresponded with technical maintenance of the parlours, or by extension and training activities with the CMP users and operators. This is, indeed, a paradox deserving attention.

Testing the Potential of Participatory Extension Work with CMP Users

The village CMP links milk producers, facilitating the flow of exchanges and collective action

The idea of building a network of CMP in the inter North of Portugal dates back to the early 70's. Progressively, with the financial contribution of different projects, this network was created, with the involvement of the cooperative structure, and having as objectives: (1) to provide technical means for small farmers to produce high quality milk; and (2) to concentrate production and provide for the transformation of milk in the region.

The development of such a network was done with a low degree of participation of the beneficiaries, reflecting the existence of a top-down cooperative movement, with no concern for the organisation of producers' groups at the village level (Cristóvão, 1986: 323).

The CMP are more than infra-structures integrated in the milk production chain. They are a space in which a group of producers meet daily, as well as an element linking these producers, facilitating the flow of dialogue and exchanges of information and experiences, and collective action.

In this sense, the aims of the project in this regard were: (1) to promote the development of a local dynamic association to function as the CMP, based upon the interactions among users, around their concerns and questions; (2) to stimulate a „demand" on the part of producers, centred on their needs, problems, interests, aspirations and challenging the local and regional services and institutions; and (3) to assess the feasibility of establishing village groups, that are, organised groups of producers-users of a given CMP.

To accomplish these objectives, an action-research approach was followed. The work was planned as a collective process, involving researchers, farmers and representatives of local institutions, with three major (articulated) aims: (1) acquiring knowledge about a given reality, namely about the production system and milk cattle management practices; (2) developing innovation, concerning the production process and hygiene and health practices, in order to improve milk quality; and (3) producing local competencies, that are developed by a process of social learning, involving all participants, related to the former aims, and having in mind deeper social, cultural and political transformations (Esteves, 1986: 271).

The results illustrate the potential for participatory extension work with CMP users

The essential steps in the process were:

(1) Rapid appraisal of the functioning conditions of 12 CMPs in the two counties. In each parlour, at least 2 producers and the operator were interviewed (see major results in table 3);

Table 3. Major results of the rapid appraisal of 12 CMPs

• Most cited problem was the low milk price
• Majority of producers ignored factors involving price formation
• Producers did not check the results of milk analysis, and only verified the quantities produced
• Majority of producers were concerned with mastitis
• Majority of producers were concerned with milk quotas and ignored how this quotas functioned in practice

(2) Observations of the milking operation in 8 CMPs, in the same counties, 4 with good and 4 with bad results, in terms of milk quality (see major results in table 4);

Table 4. Milking conditions in the area: Observation for 8 CMPs

• 3 of the best 4 parlours were relatively new
• There were no major differences in terms of management practices
• In most parlours too much water was used to clean the animals and drying was not done properly
• In only 2 parlours, the first milk „streams“ were observed and only in 1 the CMP was done regularly
• In the parlours with the worse results the cows showed poor hygiene conditions
• The majority of the parlours showed poor maintenance conditions, with holes on the floor, broken windows, dirty walls and ceiling
• In all parlours the refrigeration tank was frequently open, facilitating the contact with insects and other sources of contamination
• In all parlours it was difficult to remove animal waste
• In 6 of the 8 parlours access for the animals was difficult

(3) Analysis of the results for (1) and (2) and the definition of problems faced by producers established two issues. The formation of milk prices and mastitis emerged as the major concerns, and were chosen as the working subjects;

(4) Selection of 2 CMPs, one in each county, based on the following criteria: parlours with milk quality problems; considerable number of animal (>20); significant number of producers (>10);

(5) In-depth interview of 17 users of the two CMPs, to acquire knowledge about their farms, production systems, and cattle management practices and problems;

(6) Planning and implementation of extension activities. Five group initiatives were promoted, 2 in one village and 3 in the other, with the objectives of exchanging information about milk prices and mastitis, deciding on how to conduct and manage the milking operation, and stimulating group work and collective action. The large majority of the producers participated in such activities. The researchers took a non-directive attitude, acting essentially as facilitators, and, to a minor extent, as trainers and information providers.

The number of activities was small, and involved only two CMPs, but the results illustrate the enormous potential for participatory extension work. Nonetheless, such work has been absent from the regular practice of the institutions with responsibilities in the agriculture sector, particularly the Cooperatives and the Regional Directorate Agricultural Services. In general, it was observed that:

(1) Producers participated actively and absences were very rare. They formulated questions, talked with each others in smaller groups, presented complaints, and compared practices;

(2) The leaflet prepared about milk prices attracted the attention of all, even the illiterate;

(3) In the village visits in between meetings the researchers were frequently contacted by farmers, individually. They raised new questions and asked for further help, showing that there was a continuing debate around the issues;

(4) After the discussions, producers appeared to be more attentive to milk prices, as they knew how these were formed and were able to read the payment receipts;

(5) In one of the villages, the producers called for another meeting on mastitis and milk quality, and asked the Cooperative Dairy Union to carry out a set of more complex analysis to control milk quality. In the same village, they collectively decided about new measures to control mastitis and improve milk quality. The researchers served as discussion facilitators;

(6) The measures taken collectively led progressively to better quality. In fact, in two months, the indicator used to measure quality (number of somatic cells) improved by 50%.

Conclusions: Basis for a New Dynamic in Local Problem Solving Related to the CMP and Milk Production

The development of extension activities created the basis for a new dynamic in problem solving, as producers consciousness on the need for collective action strengthened.

The continuity of the process, however, requires regular extension work, to consolidate the group spirit and stimulate the effective creation of local milk producers committees or CMP user groups. The following recommendations have this aim in mind:

(1) Create a CMP Extension Team, involving technicians from different institutions, with distinct disciplinary backgrounds, including elements trained in extension and rural development animation;

(2) Follow-up such work with a systems view and participatory action research methods, in which technicians serve as facilitators, stimulating mutual trust among partners, and permanent dialogue and negotiation;

(3) Direct particular attention to the promotion and organisation of exchange flows between the different actors (farmers, CMP operators, researchers, technicians), to facilitate the analysis and resolution of local problems;

(4) Evaluate such work on the basis of two major criteria: The development of local capacities, at the village level, to reflect, question, use information, make decisions; and the creation of CMP user groups, actively participating in managing such village infra-structures and promoting other initiatives related to agriculture development and rural change.

The project demonstrated that there was a broad field for extension work, focused on such matters as animal management and hygiene, with potential positive impacts in terms of milk quality, and better income and quality of life for small farmers. This will help maintain populations in the rural areas, avoiding further desertification, and preserve the environment which has been sustained through the dominant low-input approach within the farming systems.

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