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Collaborative supply chain initiatives as devices to cope with income variability in the Scottish red meat sector

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Collaborative supply chain initiatives as devices to cope with income variability in the Scottish red meat sector

Cesar Revoredo-Giha and Philip Leat¹

Abstract

The purpose of this paper is to discuss whether collaborative supply chain initiatives may help to provide income stability for farmers, focussing the analysis on the red meat supply chain in Scotland. Collaborative supply chains may contribute with two elements to attain higher income stability: first, greater demand stability and market access, and second, less variability in the price received for carcasses, as the produced output fits better the required specifications (i.e., no lost premia). The analysis of a survey applied to Scottish red meat producers showed that farmers that are part of a producers' club do not differ from other farmers in their perception of marketing problems (e.g., price stability, etc.). However, in terms of their marketing aims, at least for beef producers, they seem to be more satisfied than farmers selling through auctions. An in-depth case study of a producers' club in Scotland showed that farmers within the club are heterogeneous, not all of them taking advantage of the possibilities offered by the club in terms of improving the quality of their output and targeting better the required specifications, which creates potential to attain more stable income.

Keywords: Income instability, producers' clubs, red meat sector, Scotland.

1. Introduction

The Common Agricultural Policy (CAP) reforms adopted in 2003 have sought to encourage EU farmers and their businesses to become more market orientated. However, the introduction of the Single Farm Payment has been of particular concern for the Scottish beef and sheep sectors, because of the high proportion of farm income derived from direct subsidies made to farmers.

Whilst the new policy setting is expected to increase farmers' exposure to market forces, it is also recognised that it will increase the diversity of risks faced by producers. This certainly increases the need for instruments for risk management. In this respect, as shown in Lantra (2003), the UK Government and agricultural-related institutions (e.g., levy boards) offer training materials and guidance to farmers on the use of financial instruments for risk management. However, despite these efforts, farmers' use of these instruments is still limited, a phenomenon that is not uncommon

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in agriculture (e.g., USCFTC, 1978; Blank et al., 1997; Schroeder et al., 1998; Pennings and Leuthold, 2000; Simmons, 2002; Lantra, 2003).

In a related manner, the Scottish Executive has set an strategy to strengthen the links between primary producers and other food industry sectors and to promote wider use of the principles of collaborative supply chains², with producers, processors and retailers working together to develop markets, share information and achieve sustainable contracts (Scottish Executive, 2006). This approach can be seen as a response to the economic pressures that are driving the evolution of food chains and encouraging greater vertical and horizontal co-ordination. Furthermore, it can be seen as a compromise in market organisation between traditional spot markets and complete vertical integration; an approach which suits the independently-minded nature frequently observed in farmers (Fearne, 1998).

According to Fearne (1998), based on Hughes, 1994, “in the context of the agri-food industry, a vertical partnership [e.g., a producer club] may be defined as “... some arrangement between buyer and seller, entered into freely, to facilitate a mutually satisfying exchange over time, which leaves the operation and control of the two businesses substantially independent”. There are four key aspects of this definition: (1) partnerships are entered into “freely” – partners do have a choice, although the upstream options may be becoming increasingly limited; (2) partnerships must offer “mutual” benefits – these are many and varied and their distribution is one of the key problem areas; (3) these benefits occur “over time” – what distinguishes partnerships from open market “spot trading” is the time dimension of the payback, which we generally associate with investment; and (4) partners remain “substantially independent” – what distinguishes vertical partnerships from vertical integration is the lack of equity sharing and the absence of contractual obligations.” (p. 224)

In addition, in the context of livestock production, a producers’ club may be created for the purpose of improving communication and relationships between the processor / retailer and its suppliers of finished livestock. Its activities may include the provision of a newsletter, regular meetings with key speakers on market developments and customer requirements, farm visits to observe good practice, factory visits to observe processing operations and the quality attributes of carcasses, and other activities which communicate how to improve the farm level and market performance of livestock.

In this context, the question addressed in this paper is whether collaborative supply chain initiatives, such as producers’ clubs encouraged or established by multiple retailers, may also help to provide income stability for farmers. Specifically, collaborative supply chains in the finished livestock chain may contribute in two ways to the attainment of higher income instability: first, greater demand stability and market access, and second, less variability in the price received for carcasses, as the produced output better matches the required specifications (i.e., no lost premia).

We focus the analysis on the red meat supply chain in Scotland (i.e., beef and sheep), not only because it is the most important agricultural sector in the country (Leat and

² There are several names used as synonymous for collaborative supply chains such as producers’ clubs, collaborative partnerships, partnerships, etc.

Revoredo-Giha, 2007) but also because in comparison with the arable sector, its farmers have less possibilities for production diversification.

The empirical approach comprises a twofold strategy: first, an analysis of a survey applied to Scottish red meat producers (SAC, 2006) with the purpose of determining whether those farmers engaged in collaborative supply chain initiatives -in comparison with those not engaged- perceive price variability and other marketing problems as less important. Second, we consider an in-depth case study, that of the McIntosh Donald Producers Club in Scotland. This is an interesting case, because it is a collaborative venture that places importance on the provision of information to enhance farm enterprise performance.

The structure of the paper is as follows. First, we present an overview of the Scottish red meat sector. Second, we review the literature of collaborative supply chains in the red meat sector in the UK. Third, we proceed with the empirical section, which, first, presents the statistical analysis of the survey of Scottish producers and, second, the in-depth case study. Finally, we present some conclusions.

2. The Scottish beef and sheep industry

The livestock and meat marketing chain is a complex network of enterprises of varying sizes and activities. It includes the breeders and finishers of animals, marketing organisations (including livestock auction markets, where animals are sold on a liveweight basis, and marketing co-operatives, agents and dealers), primary processors (engaged in slaughtering, meat-cutting and packing), secondary processors (catering butchers and meat product producers) and distributors (wholesalers, traditional butchers, multiple retailers and food service companies).

Within Scotland the beef and sheep sectors are major parts of the agricultural economy, representing 27 per cent and 10 per cent respectively of agricultural output in 2005; with beef being the largest single part of the farming industry (Scottish Executive, 2006a). In total there are approximately 13,300 holdings with beef cattle and 15,800 with sheep (Scottish Executive, 2006b). Whilst production is spread across the country, there are particular concentrations of cattle in the South and South West of Scotland as well as the North East. For sheep there are concentrations in the South and South West and the Highlands.

Finished animals, ready for slaughter, are predominantly sold either directly to a slaughterer processor on a deadweight and carcass quality basis, or through a livestock auction market where price is determined by open bidding. With one major exception, multiple retailers secure their requirements through slaughterers who are directly procuring animals on a deadweight basis. Those slaughterers procuring finished animals through the auction markets are largely serving independent butchers and the wholesale and catering sectors. Within the UK in 2004, 77 per cent of beef cattle were sold direct to abattoirs on a deadweight basis, reflecting the importance of beef sales through multiple retailers, whilst for lambs the figure was 62 per cent (Meat and Livestock Commission, 2005). In Scotland the deadweight proportions are likely to be slightly lower because of the strong network of livestock auction markets.

Although there are 30 meat processing plants in Scotland, the 5 largest cattle plants account for approximately two thirds of the kill. Scottish processors sold 180,000 tonnes of beef in 2005 valued at £460 million, and 27,500 tonnes of sheep meat worth £85 million. The meat is distributed widely throughout the UK and Europe. For beef, some 73 per cent of 2005 production by value was distributed to other parts of the UK, whilst for sheep meat, 44 per cent went to the rest of the UK and 25 per cent was exported.

Scottish primary processors trade largely with retail outlets, with over 70 per cent of production sold to multiple or independent retailers in 2005. By value, 56 per cent of beef and 64 per cent of sheep meat went through multiple retailers, 16 per cent and 13 per cent respectively through independent retailers, 19 per cent and 8 per cent to food processors and food service companies and 9 per cent and 16 per cent to retail wholesalers (QMS, 2006).

Scottish beef and sheep meat are regarded as high quality products within the domestic and international markets. Within Scotland the beef breeding herd represents some 70 per cent of the total cattle breeding herd (QMS, 2006), whereas within British beef production it is estimated that 50 per cent derives from progeny of the national dairy herd. One of the most evident benefits of the Scotch brand, which is registered as a Protected Geographical Indication, is that on beef cattle it typically achieves a premium of 5-10 per cent over other British beef.³

3. Collaborative supply chains in the red meat sector in the UK

The purpose of this section is briefly to review the available literature on collaborative supply chains in the UK red meat industry, putting emphasis on those elements that may help to reduce farm income variability.

It is important to note that literature on collaborative partnerships in the food industry, despite its importance, is scarce. As regards the UK beef supply chain, two main two references are the papers by Palmer (1996) and Fearn (1998). Palmer analyses the experience of the UK Meat and Livestock Commission (MLC) as a counsellor and adviser on over 40 collaborative initiatives, aimed at developing better integration and partnership within the marketing sector.

In Palmer's view, the message from collaborative partnerships is that farmers should develop links with other sectors of the marketing chain, in order to supply the right and consistent quantity and quality of "differentiated product". But the structure of the livestock farming units may be an impediment, as in many parts of the UK they are too small to motivate farmers to work in this way. In addition, another reason behind the slow development of collaborative experiences is the "open pricing-adversarial" transaction system, typified by opportunistic spot market selling/buying, which according to him will not disappear until partners build a better sense of value in the alliance.

³ Protected Geographical Indication (PGI): the specific quality, reputation or characteristics of the product are attributable to that geographical origin and the production and /or processing of which take place in the defined geographical area (European Council Regulation No. 2081/92).

The points advanced by Palmer may imply that successful collaborative efforts within the supply chain may help farmers by assuring market access, and in this sense reducing the marketing cost of searching for appropriate buyers. Also, by focussing on a differentiated product and being more consistent producers, in terms of quantity and quality, farmers have the possibility of receiving a higher and more stable flow of income.

Fearne's paper (1998) provides an overview of collaborative supply chain experiences in the UK beef industry and aims to illustrate why partnership schemes have developed, how they operate and some of the major problems which arise. The information from the paper comes from a survey of more than 2,000 farmers and semi-structured interviews with some of the country's largest beef processors and meat buyers from the major supermarkets, over a period of six months (from August 1997 to February 1998).

According to Fearne (1998) the emergence of partnerships between producers, abattoirs and supermarkets has been an important feature of the UK beef industry since the 1990s, and by 1998 they accounted for approximately one fifth of UK beef production.

As the marketing through a producers' club implies selling cattle on a deadweight basis, Fearne points out that the choice between liveweight (selling to livestock auctions) and deadweight is a fundamental one for a farmer considering joining a producer group. Furthermore, this leads to questions about quality and price premiums for deadweight selling. In relation to this issue, a problem when deciding between the two marketing channels is that average deadweight prices and average auction prices are not consistently different. However, top quality grades consistently deliver higher prices for farmers, which can reach up to 8p/kg over auction prices.

According to Fearne, there are five advantages of belonging to a producers' club as far as the livestock industry in general: (1) improved market access; (2) improved communications; (3) higher profit margins; (4) greater discipline; and (5) the creation of barriers to entry.

As regards the topic of this paper, the points made above may have important implications in terms of income stability. Thus, securing access to a higher value and/or larger volume segment of the market might be of importance to producers. Fearne argues that the choices facing producers and processors are limited and guaranteed access to the shelves of one of the top five supermarkets is itself a benefit, leaving producers and processors to focus on what they do best and make maximum use of production capacity. One may argue that this access might not be stable as supermarkets might suddenly decide to change their suppliers. However, as both Palmer (1996) and Fearne (1998) point out, it is in the supermarket's interest to maintain stable relationships with reliable suppliers due to the cost of search and the need to provide the market with consistent quality products. For instance, large supermarkets with 'own label' products are increasingly dependent on fewer, larger suppliers with the technical competence to provide scope for developing the fresh meat category. The more a supplier can do to meet the needs of their retail customers

(and ultimately their final consumers), the more difficult it becomes for retailers to consider switching to alternatives.

Improved communications can be a source of competitiveness and reduce inefficiencies along the supply chain. In this sense, retailers are increasingly sharing sales data with their suppliers, enabling them to improve their production planning.

As for higher marketing margins, Fearne indicates that, for instance, in the case of the partnership between Scotbeef and Marks & Spencer, although they pay marginally higher prices for their cattle, this may not be the main reason for participating in the scheme. Other reasons are associated with a more stable market; a reliable and comfortable relationship with the buyer; a more stable income, helping them plan more effectively and take investment decisions more easily; information fed back to them from the processor, helping them to improve their production methods; a network of contacts, all of whom exchange information and advice.

In the context of CAP reform, and in the absence of direct subsidies that operated as a protective umbrella, farmers need to learn how to improve the marketing of their animals and improve on-farm performance where possible, and partnerships with processors and retailers offer these possibilities to farmers.

Finally, the development of retailers' brands allows supermarkets to exercise some monopolistic power through market differentiation. However, as mentioned, this depends on their capacity to engage appropriate suppliers that can provide them with the right product specifications and quantities. In this sense, product differentiation becomes a protective method to ensure market stability for producers.

As pointed out through this brief literature review, partnerships present the possibility of improving the income stability of farmers; however, this depends on farmers' willingness to engage in partnerships, which may depend on their business and marketing objectives. This issue, and also whether farmers belonging to partnerships perceive marketing problems as less important, is the topic of the following empirical section.

4. Empirical analysis

The empirical analysis has two parts, first we analyse a survey and second we present an in-depth case study.

4.1. Results from a producers' survey

Survey characteristics

In this paper we analyse a postal survey carried on during the months of March to June 2006 as part of the IMCAPT project (SAC, 2006). The survey sample was designed to be representative of the Scottish beef and sheep producer sector (i.e., red meat producers). In order to exclude "spare time holdings", the sample considered only farms with sizes of 1 or more Standard Labour Requirement (SLR). The SLR is a measure of farm size based upon the labour input required (1 SLR equates to 1,900 hours of labour input required per year).

According to the June 2005 Scottish Agricultural Census, the number of beef and sheep producers in Scotland with more than 1 SLR was 5,481. From this universe 1,778 producers were selected to produce a target sample that was representative by region and farm size. The sample considered 14 Scottish regions (Shetland, Orkney, Eileanan an Iar, Highland, NE Scotland, Tayside, Fife, Lothian, Scottish Borders, East Central, Argyll and Bute, Clyde Valley, Ayrshire, Dumfries and Galloway) and 4 farm size groups (farms from 1 SLR to 2 SLR, more than 2 SLR to 3 SLR, more than 3 SLR to 4 SLR, and more than 4 SLR).

The survey questionnaire was mailed to the 1,778 producers, and an overall response of 34 per cent was obtained after two mailing waves. The detailed distribution of the sample, together with the response rates by region and SLR, is presented in Table 1.

Table 1. Distribution of the sample by region and SLR

Regions	Standard Labour Requirement Group (SLR)				Total	Response rates by region (%)
	1≤2	2≤3	3≤4	>4		
Shetland	9	3	1	1	14	26.4
Orkney	11	9	4	4	28	37.3
Eileanan an Iar	4	0	0	0	4	33.3
Highland	30	15	7	20	72	32.1
NE Scotland	46	21	16	16	99	33.4
Tayside	17	9	6	18	50	48.5
Fife	5	2	4	2	13	28.9
Lothian	5	2	1	8	16	39.0
Scottish Borders	6	6	11	29	52	36.9
East Central	4	4	2	11	21	35.6
Argyll & Bute	7	6	7	10	30	26.3
Clyde Valley	14	11	1	8	34	26.4
Ayrshire	21	17	7	14	59	37.6
Dumfries & Galloway	39	24	19	37	119	36.2
Total	218	129	86	178	611	
Response rates by SLR (%)	33.6	34.9	34.0	35.1	34.4	

The survey questionnaire comprised three sections: the first section enquired about farmers' marketing problems; whilst the second explored specific issues within the red meat supply chain with the purpose of providing a snapshot of chain features from the farmers' perspective and identifying challenges for the further development of collaborative supply chains and improved supply chain relationships. The last section dealt with possible farmers' production and marketing responses to CAP reform.

As regards the composition of the resulting sample, out of the 611 farmers, 16 per cent were found to be cattle specialists, 27 per cent were sheep specialists, with the remainder being producers of both cattle and sheep.

Most farmers engaged in the production of cattle were found to be exclusively breeders (55 per cent) or breeders and finishers (38 per cent), with only a small percentage being only finishers (7 per cent). These percentages were different in the case of sheep producers, where most of them were engaged in both breeding and finishing (57 per cent), followed by exclusively breeders (35 per cent) and being only finishers (7 per cent).

Regarding whether the farmers sold to a producers' club, according to the sample numbers (no census number exist), in the case of cattle production, approximately 13 per cent sold to them, 3 per cent to a different finisher and the remainder to a livestock auction. In the case of sheep, approximately 7 per cent sold to a producers' club, 1.3 per cent to a different finisher and the remainder sold their sheep to a livestock auction.

Statistical analysis

We explore three topics in the survey: first, whether those farmers belonging to producers' clubs perceived marketing problems as less intense; second, whether producers' marketing through different channels had different objectives and third, whether they were satisfied in achieving their marketing objectives, whatever they were. Table 2 presents producers' perceptions of marketing problems. These were recorded through a Likert scale of 5 levels.

Table 2: Perception of marketing problems according to different marketing channels

Marketing problem		Cattle				Sheep			
		Producers clubs	Other branded 2/	Livestock auctions	All cases	Producers clubs	Other branded 2/	Livestock auctions	All cases
Price received is low	Avg.	3.68	3.46	3.63	3.63	3.56	4.43	3.79	3.78
	St. Dev.	1.17	1.27	1.12	1.13	1.16	0.79	1.07	1.08
	N. cases	59	13	369	441	32	7	419	458
Price frequently varies	Avg.	3.03	3.23	3.22	3.20	3.45	3.86	3.60	3.60
	St. Dev.	1.12	1.24	1.06	1.07	0.99	0.90	1.05	1.04
	N. cases	58	13	361	432	31	7	419	457
It is difficult to find a reliable buyer	Avg.	1.47	1.42	1.87	1.80	1.81	1.60	2.28	2.24
	St. Dev.	0.77	1.16	1.10	1.07	0.87	0.55	1.21	1.19
	N. cases	55	12	327	394	31	5	369	405
No information to plan production ahead	Avg.	2.55	3.00	2.68	2.67	2.47	3.00	2.75	2.74
	St. Dev.	1.05	1.48	1.22	1.21	0.94	0.82	1.23	1.20
	N. cases	55	12	325	392	30	4	370	404
Transportation costs to buyer are too high	Avg.	2.76	2.92	2.78	2.78	2.27	3.80	2.77	2.75
	St. Dev.	1.34	1.44	1.26	1.27	1.05	1.79	1.34	1.34
	N. cases	59	12	330	401	30	5	378	413
Grading system is not transparent	Avg.	2.65	2.77	2.55	2.57	2.67	2.40	2.44	2.46
	St. Dev.	1.27	1.30	1.25	1.25	1.32	0.55	1.22	1.22
	N. cases	57	13	311	381	30	5	358	393
It is difficult to anticipate animal grade	Avg.	2.39	2.62	2.38	2.39	2.43	2.20	2.38	2.38
	St. Dev.	1.11	1.39	1.19	1.18	1.19	0.84	1.17	1.17
	N. cases	59	13	310	382	30	5	365	400
Not enough information about best buyer	Avg.	2.47	2.33	2.45	2.45	2.39	2.33	2.52	2.51
	St. Dev.	1.09	1.07	1.26	1.23	1.09	0.58	1.11	1.10
	N. cases	55	12	298	365	31	3	354	388

Note:

1/ The underlying data for each marketing problem is a Likert scale (5 levels) where the answers rank from not a problem (1) or significant problem (5).

2/ Sales to a processor that is not part of a producers' club.

Although producers' club farmers seem to have a slightly better opinion about several of their marketing problems (i.e., they were less than a problem), it is important to note that none of the differences between producers club results and livestock auctions were statistically significant. Differences with respect to 'other branded' were not performed due small number of observations.

Table 3 presents the marketing objectives of producers by different marketing channels. The results only have relevance for cattle producers as the survey recorded few answers for sheep producers.

Table 3: Marketing aims according to marketing channel

	Marketing channels for cattle production							
	Producers clubs		Other branded ^{2/}		Auctions		All	
	Cases	% 1/	Cases	% 1/	Cases	% 1/	Cases	% 1/
To sell to the local / nearest buyer	15	23.81	3	21.43	121	28.47	139	27.69
To sell through a friendly individual or business that I feel I can trust	22	34.92	5	35.71	158	37.18	185	36.85
Diversification of buyers (i.e. not to sell too much to one buyer)	12	19.05	2	14.29	62	14.59	76	15.14
To minimise the cost of marketing your animals	28	44.44	6	42.86	192	45.18	226	45.02
To sell to whoever is likely to offer the highest price for your output over time (i.e. over a season)	18	28.57	3	21.43	163	38.35	184	36.65
To sell to whoever is likely to achieve the highest net price (net of marketing costs) over time	31	49.21	4	28.57	142	33.41	177	35.26
To be confident that the output is adequately graded and priced	28	44.44	6	42.86	145	34.12	179	35.66
To establish a long term partnership with a reliable buyer	27	42.86	4	28.57	151	35.53	182	36.25
To sell the product through large volume outlets (e.g. supermarkets)	2	3.17	1	7.14	16	3.76	19	3.78

	Marketing channels for sheep production							
	Producers clubs		Other branded ^{2/}		Auctions		All	
	Cases	% 1/	Cases	% 1/	Cases	% 1/	Cases	% 1/
To sell to the local / nearest buyer	0	--	0	--	0	--	0	--
To sell through a friendly individual or business that I feel I can trust	0	--	0	--	18	3.83	18	3.52
Diversification of buyers (i.e. not to sell too much to one buyer)	2	5.88	0	--	8	1.70	10	1.96
To minimise the cost of marketing your animals	2	5.88	0	--	10	2.13	12	2.35
To sell to whoever is likely to offer the highest price for your output over time (i.e. over a season)	2	5.88	0	--	5	1.06	7	1.37
To sell to whoever is likely to achieve the highest net price (net of marketing costs) over time	2	5.88	0	--	5	1.06	7	1.37
To be confident that the output is adequately graded and priced	1	2.94	0	--	9	1.91	10	1.96
To establish a long term partnership with a reliable buyer	2	5.88	0	--	9	1.91	11	2.15
To sell the product through large volume outlets (e.g. supermarkets)	0	--	0	--	0	--	0	--

Note

- 1/ Percentages with respect to the total of farmers of the group.
2/ Sales to a processor that is not part of a producers' club.

For most of the aims, farmers operating through producers' clubs and auction markets show similar percentages (proportion of producers that took the objective into account). However, notable differences arise with respect to 'To sell to whomever is likely to achieve the highest net price (net of marketing costs) over time' (49.2 per cent for producers' clubs versus 33.4 per cent for auction markets), 'To be confident that the output is adequately graded and priced' (44.4 per cent for producers' clubs versus 34.1 per cent for auction markets) and 'To establish a long term partnership with a reliable buyer' (43 per cent in the case of producers' clubs versus 36 per cent for livestock auctions).

Table 4 presents the degree of satisfaction of producers in terms of their aims with respect to their main marketing channel. Whilst the average score for producers' clubs is slightly higher than for the other marketing channels, it is not statistically significant.

Table 4: Satisfaction with respect to marketing aim achievement by main marketing channel

Main marketing channel	Cattle production					Average Score
	Poor (1)	Fair (2)	Average (3)	Good (4)	Excellent (5)	
Producers clubs	0	3	15	43	2	3.70
(%)	0.00	4.50	22.49	64.47	3.00	
Other branded 1/	0	2	4	7	0	3.38
(%)	0.00	12.21	24.41	42.72	0.00	
Auction	0	22	149	172	16	3.51
(%)	0.00	6.07	41.10	47.45	4.41	
All	0	27	168	222	18	3.53
(%)	0.00	6.16	38.31	50.62	4.10	
	Sheep production					Average Score
	Poor (1)	Fair (2)	Average (3)	Good (4)	Excellent (5)	
Producers clubs	0	2	20	11	1	3.32
(%)	0.00	5.36	53.59	29.47	2.68	
Other branded 1/	0	1	3	3	0	3.29
(%)	0.00	9.72	29.17	29.17	0.00	
Auction	18	40	175	171	17	3.31
(%)	4.24	9.43	41.24	40.30	4.01	
All	18	43	198	185	18	3.31
(%)	3.87	9.24	42.55	39.76	3.87	

1/ Sales to a processor that is not part of a producers' club.

It should be noted that the distributions presented in Table 4 appear different for each marketing channel. This is better perceived in Figures 1 and 2 that compare the distributions for producers' clubs and livestock auctions for cattle and sheep. Differences between the distributions were tested through the Kolmogorov-Smirnov test. In the case of cattle, the null hypothesis that both distributions were the same was rejected at 5 per cent significance. In the case of sheep, the null hypothesis could not be rejected.

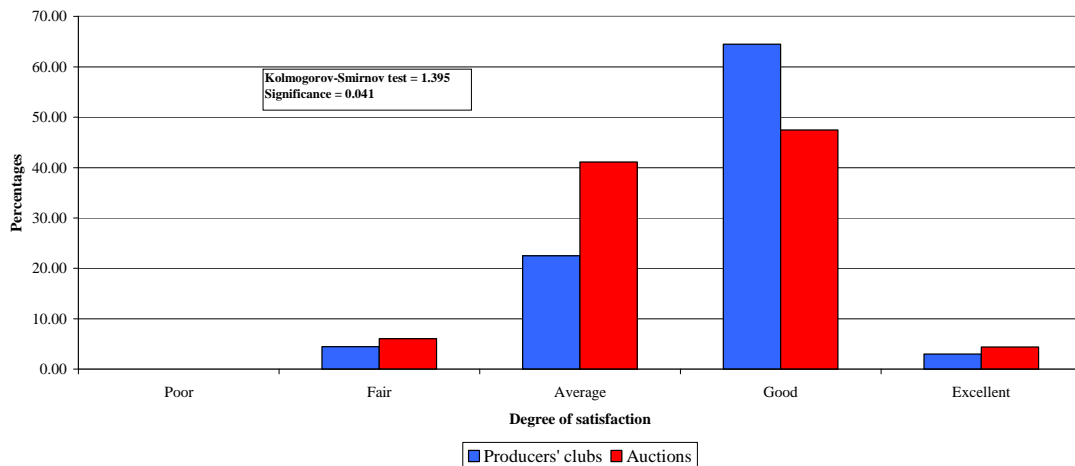


Figure 1. Cattle marketing: Comparison between the distributions of aims' satisfaction in producers' clubs and livestock auctions.

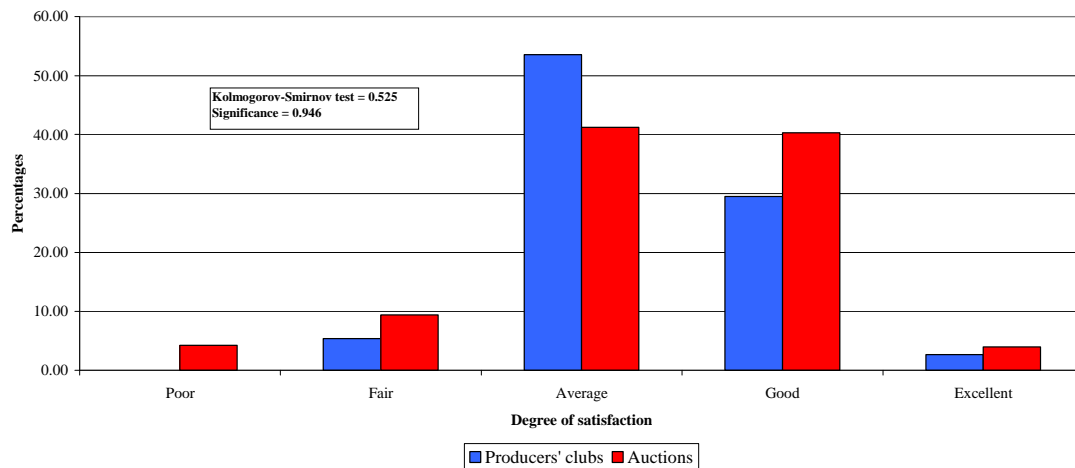


Figure 2. Sheep marketing: Comparison between the distributions of aims' satisfaction in producers' clubs and livestock auctions.

In summary from the statistical analysis, cattle farmers marketing through producers' clubs seem slightly more satisfied in terms of their marketing aims. However, in terms of their perceptions of marketing problems, their views are quite similar to those selling through livestock auctions.

4.2. Case study

The results from the statistical analysis are far from conclusive with respect to the capacity of producers' clubs to improve farmers' income stability. Thus, it is worthwhile to consider an in-depth case study, in order to gain knowledge about the functioning of such a club and to what extent they can play the role of income stabilisation devices.

The selected case study was based on the McIntosh Donald-Tesco Producer Club. McIntosh Donald is an important beef processor located in the North East of Scotland and is a major red meat supplier to Tesco. This producers' club is interesting, not only because it is associated with the most important supermarket in the UK, but also because it has introduced Qboxanalysis, a software system aimed at improving the on-farm performance of cattle production (e.g. through reducing the numbers of days to slaughter and associated production costs) and farmers' targeting of the specifications required by the abattoir, which for those farmers using it successfully may represent a reduction in their income variability.

The methodology used in the case study comprised a series of interviews held with chain participants in August and September 2007 as part of the FOODCOMM project (FOODCOMM, 2007). Some of these interviews were conducted on a face-to-face basis, whilst others were conducted over the telephone with further information exchanged by email. The interviews were assisted by the use of a discussion guide. Individuals from the following enterprises were interviewed: developers and operators of the Qboxanalysis system for cattle (Innovent Technologies Ltd.); slaughterer and processor - sponsors of Qboxanalysis (McIntosh Donald); beef farmers (McIntosh Donald Beef Producer Club members); the national farm advisory service (provided by the Scottish Agricultural College - SAC); and Tesco.

The producer club

Tesco's Producer Group was launched in 1996. The group enables Tesco to ensure that all of the meat it sells comes from animals which can be traced back to the farm where they were born and which have been reared to the highest possible standards.

The nationwide Producer Group is made up of three established Producer Clubs, one of which is in Scotland and run in association with McIntosh Donald. Each producer club has their own committee made up of farmers and representatives from the processor and Tesco. A full-time Producer Club management employed by Tesco coordinates the activities of the clubs and liaise with other industry bodies such as the MLC and NFU (Fearne, 1998).

The Producer Clubs are seen as a way of establishing loyalty in the supply chain. There are no firm contracts but "gentleman's agreements". The QMS assurance scheme (SQBLA -Scotch Quality Beef and Lamb Association- Farm Assurance Scheme before the creation of Quality Meat Scotland in 1999) is the basic requirement and each farm is audited independently. Not all the producers' livestock have to be sold through the club, but if they continually fall short of specification then they are removed from the club (Fearne, 1998).

Demand stability

According to Tesco, as quoted in Fearne (1998), the main benefit to producers is a guaranteed market for livestock sold through the Club – Club livestock are always given priority.

It is important to note that market access for farmers producing cattle of reasonable specifications is not a problem, because there is an excess of capacity in the industry

and processors require good levels of plant throughput in order to maintain cost-efficiency. In this sense, demand instability, although a potential problem that can be solved through access to the club, is actually not an important problem when marketing beef.

Price premium and income stability

In contrast to the case of demand instability, income fluctuation due to unsuccessful targeting of the required processor specification seems to be a significant problem. This was pointed out by Fearne (1998) as regards the percentage of carcasses that do not conform to the ideal specification.

It is important to note that failure to achieve the right specification reflects not only on the producers' income level (i.e., not getting the premium paid for top quality product) but also in their income variability (i.e., as the production quality is variable, the price received for the carcass is also variable). In this context, the producer club has the potential to help improve both problems, income level and income variability, through a good flow of communication throughout the supply chain. One of the communication devices is Qboxanalysis⁴, which is an information communication system for beef cattle which was developed in 2003/04 and made available to the McIntosh Donald Beef Producer Club members in March 2005.

Qboxanalysis provides detailed information, at no cost to the farmer, on a range of features of each animal slaughtered by McIntosh Donald. The information which is supplied to a producer for either a 7 day, 13 weeks or whole-year time period, covers: the number of animals delivered to the processor; the weight, quality and value of the carcasses produced; the age at slaughter and average weight gain over the life of the animal; as well as indicating the presence of fluke damage or not. This information is provided for the individual producer as well as all animals passing through the plant. By enabling meaningful comparisons with other producers, Qboxanalysis has the potential to indicate in broad terms how a farmer might approach improving the on-farm performance of their cattle and achieve improved returns through greater production efficiency, better matching of production with market requirements and reduced disease problems.

As at August 2007 the system had 429 registered farmer users of which 100-150 were regular users (i.e. delivering cattle for slaughter and logging onto Qboxanalysis). This number of registrations is very close to the number of McIntosh Donald cattle suppliers who have an email address. These farmers were delivering approximately 15,000 cattle, i.e., 19 per cent of the 80,000 cattle supplied to the factory annually.

From the interviews it became apparent that those who register to receive Qboxanalysis are already connected to the internet for other reasons, rather than getting connected in order to access Qboxanalysis. The use of the system is also constrained by the fact that currently the data presented are of most relevance to a farmer who both breeds and finishes his own cattle ready for slaughter. This is because much of the performance information relates to the whole life of the cattle

⁴ Another devices are the activities of the producers' club, which try to improve trust and communication along the supply chain.

concerned, i.e. age at slaughter, weight gain per day over the life of the animal, margin over the whole life, etc.). The appeal of Qboxanalysis to farmers who are beef 'finishers', i.e. those who buy 'store' animals which others have bred and then feed them through to slaughter, will be greatly enhanced when it carries a module which reports on performance over the 'finishing period'. For this to be achieved, purchase data have to be entered onto the system, including the holding of birth, weight at purchase and time of purchase. The system could then provide 'finishers' with accurate data on the performance of cattle during the time on their farm. The breeder could also potentially receive information on how their store animals performed through to slaughter, which could ultimately influence breeders' decisions on the genetic qualities of their suckler cows and bulls.

Within the case study it is apparent that at present there are broadly 3 types of farmer registered with Qbox. The first group (about 65 per cent of cattle suppliers) are those who are registered with the system but who infrequently log on or make use of it. The second group, the 'reassured', are those who log onto the system and use it to provide confirmation that their beef production enterprise is operating satisfactorily. Such farmers are generally operating at average or above average levels of performance. This relatively passive usage is in itself beneficial in that it reassures those with basically sound beef husbandry practices. Moreover, in time such users may become more proactive in developing their beef production based upon Qboxanalysis information.

The third group, the 'active' users, is a smaller one that comprises those who are logging onto the system regularly (when they put cattle away for slaughter) and are using the information gained to influence their enterprise management practices and decisions. For example, such producers may engage in: weighing animals at a younger age and batching them according to weights rather than age; weighing cattle more regularly and being more selective about which animals are put away for slaughter; getting a better understanding of the relationship between the liveweight of animals and their deadweight; changing the bull that is put onto the suckler cows; confirming the quality of a particular source of store cattle; reviewing feeding rations to try and achieve better weight gain and earlier finishing; treating cattle for fluke when they come onto the farm; reviewing the grazing used by stock when fluke problems have arisen; putting animals that are not ideal for McIntosh Donald to another market (e.g. through the livestock market).

The second and third groups of producers, the 'reassured' and 'active' users, may represent 35 per cent of registered users and 10-15 per cent of McIntosh Donald's cattle suppliers.

Thus, to make full use of Qboxanalysis requires a farmer who is willing to improve the performance of his finished cattle; and who has the capabilities to decide what farm-related changes need to be made to the cattle production system (e.g. changes in the genetics of stock, adjustments to feeding systems, improved animal health and welfare, etc.). An example of what may be achieved is provided by a breeder-finisher who has steadily responded to the Qboxanalysis data for his cattle over 3 years. He has experienced a 32 day reduction in days to slaughter (486 to 454) and an improvement in deadweight gain of 0.05 kg per day (from 0.73 to 0.78). At the same time the change in the value of his carcasses has matched that of the plant average.

In short, the use of Qboxanalysis may help those farmers who are willing to engage in improving the on-farm performance of their cattle enterprise and improving the specification of their cattle (e.g., weight, fatness and conformation). In this sense, Qboxanalysis, complemented by the producers' club activities, can become an effective tool for farmers not only seeking to stabilise their income but also to raise it by improving production efficiency and targeting higher quality output that will let them to achieve the best possible prices that are available.

5. Conclusions

The purpose of this paper has been to explore whether collaborative supply chain initiatives such as producer clubs may help to provide income stability for farmers, focusing the analysis on red meat producers in Scotland.

The statistical analysis of a survey of Scottish producers, focussed on three topics. First, to see whether those farmers belonging to producers' clubs perceive marketing problems (amongst them price instability, grading problems, and difficult to find a purchaser) as less important than those that are selling their animals into auction markets or to other finishers. Second, whether farmers selling through producers' clubs have similar marketing aims to those selling through the other marketing channels, and third, whether those farmers belonging to producers' clubs are more satisfied in terms of their marketing goals than farmers selling through other channels.

The results of the statistical analysis were not conclusive, showing that farmers marketing through different channels have similar perceptions regarding marketing problems. However, the analysis of the farmers' marketing aims indicates that those farmers' that are selling through producers' club are more willing to establish long term partnerships, and in addition, at least beef producers, seem to be slightly more satisfied in terms of these aims than those farmers selling through auction markets.

The results of the case study indicate that a producers' club has the possibility of both reducing demand uncertainty and also reducing the price variability that comes from problems of inferior carcass specification. Furthermore, by improving the quality of the product through the tools provided by the producers' club, farmers also have the possibility to achieve a higher price (through a higher premium). All these aspects make producers' club a good tool for farmers' income stabilisation. However, in order for farmers to become part of the club and use their tools, it is necessary to improve the relationships between farmers and the other segments of the supply chain.

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