INNOVATION AND DEVELOPMENTS IN SUPPLY CHAIN ORGANIZATION IN EMERGING OILSEED RAPE MARKETS

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1. Introduction

Both, growing and processing of oilseed rape (OSR) and its derivatives, have experienced a large expansion in Europe in the last few years. The growing industrial consumption in Europe and Germany mainly result from the demand in the bio fuel sector due to subsidization in most countries. Health issues raised the demand for rapeseed oil in the food industry while the use of rapeseed meal is pushed by substituting soybean meal. But there are indications that in the near future the OSR-complex is facing a change towards a past biodiesel period.

The introduction of new quality traits such as High Oleic OSR or High Erucic OSR resulted in an additional increase in the number of rapeseed varieties and the utilisation of OSR products. This integration of consumer requirements in the breeding process goes along with serious impacts on all actors of the OSR supply chain. While the distribution system is focused on commodity crops yet, where the emphasis is on homogeneity, marketing and trade within the supply chain is about to change towards focussing on high-value traits in order to meet competitive advantages. There are many forces, which independently and combined, are putting pressure on the traditional production and marketing practices in agriculture. Increasing consumer sophistication, technological change, competition, environmental concerns, and biotechnology are some of the factors that are influencing tomorrow's agricultural marketplace.

This paper aims to examine how far the value-chain of OSR production and processing has to meet the consumers´ demand in order to improve consumption and which conditions for a successful cooperation between the involved actors are necessary.

2. Design/methodology/approach

To estimate the future supply and demand developments we used a Delphi survey method for quantitative analyses. A Delphi survey is a structured group interaction process that is directed in "rounds" of opinion collection and feedback in order to investigate future developments (Häder, 2002). The Delphi method is based on two or more round structural surveys and makes use of the intuitive information of the participants, who are mainly experts and who are anonymous to each other. There is agreement that Delphi is an expert survey in multi-rounds in which in the second and later rounds of the survey, the results of the previous round are given as feedback. Giving feedback and the anonymity of the Delphi survey are important characteristics.

Based on the results of the analysis of the past and the current state of the OSR-markets the questionnaire was developed, we needed to conduct the survey. The intention of the questionnaire was to evaluate future developments in the breeding, cultivation and applications of oilseed and oilfruit crops within the coming 20 years. At least 140 experts all over Europe agreed to assist this evaluation.

3. Results

The differentiation in breeding and usage of OSR we saw in the past will continue in the future. The quantity of current uses of products made from OSR and other oilseeds and their future growth rates estimated by the experts are shown in table 1.

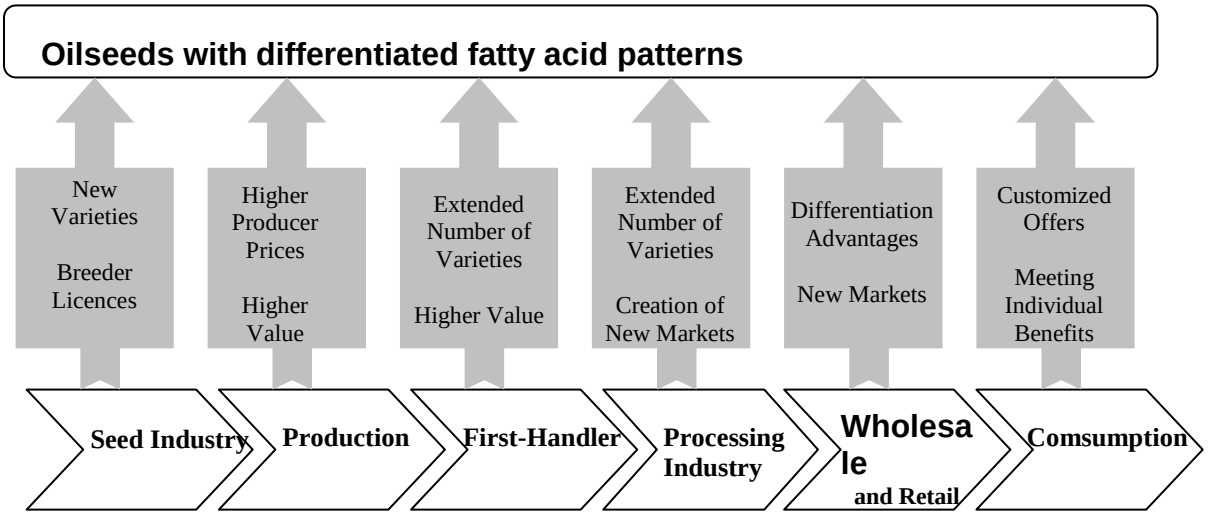
Table 1 Current usage of oilseeds and oilfruits and their future growth rates			
Usage	**Growth rate OSR p. a. in %**	**Consumption EU/D**	**Renewable resource (oilseeds and oilfruits)**
Edible oil (private use)	>2	1.3 mill. t/ 0.8 mill. t	OSR, sunflower, soybean, olive, oilpalm
Edible oil (food industry)	>2	9.2 mill. t/ 0.8 mill. t	OSR, sunflower, soybean, olive, oilpalm
Margarine	>2	2.2 mill. t/ 0.4 mill. t	OSR, sunflower, soybean, olive, oilpalm
Protein concentrates, isolates and texturates	0,1-2	0.4 mill. t/ 0.05 mill. t	soybean
Lecithine	>2	70 000 t/ 10 000 t	OSR, sunflower, soybean
Oilseed meals	>2	50 mill. t/ 7.7 mill. t	OSR, sunflower, soybean, palmkernel
Oilseed feed	0,1-2	300 000 t/ 90 000 t	OSR, sunflower, soybean
Feed oils	0,1-2	750 000 t/ 400 000 t	OSR, sunflower, soybean
Biodiesel	>2	7.7 mill. t/ 2.7 mill. t	OSR, sunflower, soybean. oilpalm
Biolubricants	>2	63 000 t/ 47 000 t	OSR, sunflower, soybean
Tensides	0,1-2	1 mill. t/ 0.4 mill. t	Oilpalm, coconut
Paints and varnishes	0,1-2	200 000 t/ 83 000 t	Soybean, sunflower, oil flax
Inks	0,1-2	120 000 t/ 77 000 t	OSR, sunflower, soybean, oil flax
Proteins Nonfood	0,1-2	1 000 t/ ./.	soybean
Polyurethane	0	100 000 t/ 70 000 t	OSR, sunflower, soybean
Polyamide	0	./.	OSR, sunflower, soybean

Source: Hart/Kühl, 2010

The introduction of OSR plants with new quality characteristics has to be in competition to alternatively usable raw materials linked with a balanced use for all involved actors of the value-added chain. Figure 1 shows the experts estimation concerning conditions for a successful commercialization of domestic oil plants with new quality characteristics. The most important condition is the acceptance of this new product by the consumer. The consumer has to be able to accept the product as of higher value and to realize a personal additional benefit from the new product. As soon as the consumer demand has been realized also the processing industry will have an increased interest in obtaining the new raw materials in order to extent the existing range of products and thus to open new markets.
The First-Handler and the oil mills will only meet the demands of the industry for the supply with the new raw materials, if the consumers pay for the additionally costs caused by handling the new raw materials' quality through separating from the conventional qualities at processing, storage and transport (Darroch et al., 2002). But the farmer will only cultivate the new product qualities demanded by the industry if he can get assured producer prices and purchase quantities to optimize his profit by contract cultivating (Jefferson-Moore & Trexler, 2005).
The seed breeding companies eventually want to get compensation for the added value of the new breeds in terms of the breeder license. Furthermore the supply with a breed achieving the quality demanded by the industry is connected with obtaining a competitive advantage over the rival businesses (Leckband & Voss, 2001).

However, there is often a lack of fulfilling one or more conditions for the introduction of new qualities. Thus, many consumers doubt the benefits of plants with genetically modified fatty acid pattern (Moon & Balasubramanian, 2003) or the announced higher added value is critically assessed by the market partners (Darroch et al., 2002).

Figure 1: Necessary Conditions for Successful Oilseed Differentiation



Source: own investigations

The criteria applied by every phase of the value-added chain to OSR with modified fatty acid pattern accordingly have to be considered also in the development of new breeds. Thereby, the underlying criteria can be very complex.
Fulfilling these criteria requires an intensive communication between the processing and the seed industry in order to avoid potential differences in starting-phase.

4. Concluding remarks

The aim of this study was to offer insights into how the future market of OSR and its products will develop and what lessons can be drawn from the experts' opinion. The most important implication for the value chain is to integrate the needs and wants of potential users into the development of new oilseed varieties with qualitative traits. But it has to be considered that OSR with qualitative traits should display significant improvements in quality attributes without neglecting the given cultivation and processing advantages. A difficult task is that the players in the supply chain can change their roles during the innovation process – at different times and stages they are initiators, insurgants, adopters and this makes it very difficult bringing OSR with high value traits to market.

5. References

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