

*Joanna Szwacka-Mokrzycka*  
*Warsaw University of Life Sciences*

## **TYOLOGY OF MARKETING STRATEGIES FOR COMPANIES OF FOOD INDUSTRY**

*The paper presents the typology of marketing strategies for food industry companies in Poland. The aim of this article is to determine the most effective strategies for food industry sector in Poland. The results of estimation of the selected food markets attractiveness (based on Porter's 5 forces analysis) and segmentation (based on cyclical study TGI) are the base of typology of marketing strategies. Presented typology of marketing strategies based on research conducted in the period 1998-2012. In the framework of food industry there were selected the following branches for segmentation research: dairy, meat and edible fats. The results of research allowed to determination of possibilities of implementation of marketing strategies on the selected food markets. There are possibilities of wider use of strategies of market penetration and development and strategy of influencing on purchasers. The next recommended group are strategies of cooperation with partners in the field of distribution and strategy of the cost leadership, especially for large companies, which benefit from economies of scale. Next proposal is connected with differentiation strategy recommended for producers of new-generation products.*

**Key words:** *marketing strategy, attractiveness of food industry, TGI, specificity of companies of food industry*

### **1. Introduction**

The analysis of attractiveness of Polish food industry sector lets to estimate effectiveness of strategies performance by engaged companies. What plays an important role in estimation that attractiveness is Porter's 5 forces analysis. The results of consumer research of one source character [Target Group Index] are the baseline in typology marketing strategies. The aim of this article is to determine the most effective strategies for food industry sector in Poland. Because of increasing level of competition on Polish food market the crucial question is how to determine the sources of advantage and their implications for the choice of strategy option. What are the most important determinants of improving efficiency of food industry?

### **2. State of the art**

The research stream concerned with the competition forces analysis and competition strategy is reach. The framework for business management are Porter's works. Porter has determined the attractiveness of a market and has defined three general types of strategies that are commonly used by businesses, referring to 5 forces that determine the attractiveness of a market, [Kotler 1994, Porter 1979, Porter 1980, Treacy, Wiersma 1995]. The research referred to competition strategy in Poland has provided several insights of this question. The most of works concerned with strategy formulation and

techniques for analyzing industries and competition. One can find the proposals of well-known world concepts adoption (especially Porter's) to Polish economy, [Brogowicz Andrew A., Grashof John E., McCarthy E. Jerome, 1984, Garbarski L. 2011, Gierszewska 2000, Niestrój 1999, Oblój 1998]. In addition, there are studies concerning with analysis of competition forces and strategies implementation in different sectors. The studies concerning with food market are consistent in adopting the proper competitive advantage and strategy option for food industry companies, [Mruk 2008, Szwacka 2005, Szwacka 2007, Urban 2008]. The following classification of marketing strategies is universally accepted: strategies of product-market approach (the segment of customers), strategies of influencing on purchasers [Niestrój 1999, Szwacka-Salmonowicz 2003, Szwacka-Mokrzycka 2011, Urban 2008], strategies of cooperation with partners in the field of distribution [Niestrój 1999, Szwacka-Mokrzycka 2013]. Mentioned above strategies have wide application in food market.

### **3. Research methodology**

The research included looking for answers for the following questions:

- What are the crucial determinants of marketing strategies' use?
- What is the connection between specificity of companies and kind of proposed strategy?
- What are the determinants of improving efficiency of food industry?

For fulfilling the objectives of the research as well as results of Porters' analysis. and results of consumer research of one source character [Target Group Index] were used. The analysis of attractiveness of food industry sector lets to estimate effectiveness of competitive strategies performance by engaged companies. TGI is a standard tool to defining target groups and a reach source of information concerns of consumers' behaviour changes on food market. Presented typology of marketing strategies based on research conducted in the period 1998-2012 [Szwacka-Salmonowicz 2003, Szwacka-Mokrzycka 2011, Szwacka-Mokrzycka 2013, SMG/KRC 2013].

### **4. Specificity of companies of food industry**

Companies of food industry operate in different sectors so they have various characters (entities of such sectors as: meat, potato, oil, fat, milk, fruit and vegetable, cereals processing, confectionary, production of beverages, etc.). Agricultural and food products are perishable, which is their main feature not facilitating a long storing and causing immediate special preservation. The next feature which characterizes food products is connected with their significant volume. That is why, they need large warehouses, and taking into account that they are perishable – they also need careful and special transport, careful processing and quality control. All these issues contribute to high costs of transport, storing, processing and sanitary control. Specificity of agricultural and food products implements adjusting requirements for food industry. Moreover, diversification of companies results from a character of their links with raw material suppliers (consistent flow of supplies, production seasonality, processing technologies, transport of raw materials and products, storing, etc.). In the first decade of the XXI century, some

integration processes of companies were taking place in Poland. They had different directions, including mainly creating integrated, multifunctional firms clustering different technological operations – from a raw material to a link in a distribution chain. On the other hand, creation of companies, which concentrate different entities in a vertical scheme, is the second tendency in the field of integration. There is also a tendency to specialization of entities concentrated on basic production of organic intermediate materials.

## 5. Determinants of marketing strategies' use

### A. A concentration level of a sector

- In consolidated sectors, selection of a strategy depends on a position occupied by a company, its development aspirations as well as competition intensity. According to a set of these factors, a company can implement: a strategy of a market leader, market-challenger strategy, an imitation strategy. Characteristic features of a leader are as follows:
- the highest share in market;
- leadership among other entities in a field of changes of prices, introduction of new products, intensity of distribution and promotion;
- acceptance of the leader position on market by other market participants.

There can be listed the following conditions of keeping a leader position on market. They group:

- a possibility of increase in market demand;
- protection of contemporary share in market by defensive and offensive operations;
- operations aiming at increase in a market share, even if its total volume is constant;
- entities which occupy a second, third or next places in a sector are called challengers.

There can be distinguished the following strategic goals and directions of challengers' operation:

- increase of a market share
- increase in profits

The main directions of challengers' operation include:

- attacking the market leader (risky but potentially a profitable strategy); it has sense when the leader is a "paper tiger" or services market in a wrong way;
- attacking a company of a similar scale of operation (reasonable when a competitor has not significant resources).

A market imitator is a next described strategy. A market imitator aims at:

- keeping existing clients;
- winning new clients.

A market imitator uses the following ways of competing with a challenger:

- maintaining operation costs on a relatively low level;
- a high level of quality of offered services.

Formulation of a competitive strategy for dispersed sectors (a large number of companies of small and medium size, of which none plays a significant role on market and can strongly influence on results of a whole sector). Under such circumstances, formulation of a competitive strategy aims at determination if dispersion of a sector is not a chance for succeeding through its consolidation and taking a market leader position. In a case of a negative answer, there should be considered different variants of a competitive strategy in conditions of maintaining dispersion.

There can be significant advantages from consolidation of a dispersed sector because entrance costs are low, competitors usually weak which decreases danger of retaliation. If overcoming of dispersion is impossible, it is necessary to get used to operation under conditions of significant danger of competitors and a weak bargaining position towards suppliers and purchasers.

#### **B. Market development phase**

Distinguishing of four situations: unblocked market (disappearance of barriers blocking market creation), market of a new product (absolute or quasi novelties), market of a new need (a change in costumers' behaviour), and absolute new market (changes in environment contributing to creation of new needs), has significant influence on forming of a marketing strategy in a phase of market creation.

In a phase of growth, a marketing strategy is connected with gaining as high rate of sell as possible and a stable market position.

In a phase of maturity, a marketing strategy is connected with defence and retaining of an achieved market position. It requires efficient management of a product portfolio, getting rid of non-profitable products, and precise positioning of new products.

In an end-phase, connected with a downward trend of demand, there can be different forms of marketing strategies:

- strengthening or gaining of a leadership on shrinking market;
- placing in niches;
- gradual withdrawing from market after gaining profits resulting from chief assets of a company;
- quick withdrawing from market through sale of a plant or license.

#### **C. Determinants connected with business cycles**

Recession causes significant changes in behaviours of purchasers and competitors, which should be taken into account in a process of planning of a marketing strategy in a company. There can be distinguished three levels of a reaction for risks connected with business cycles:

- savings and limiting of operations (a change in marketing goals, shortening of a planning horizon, and a change in rules of planning marketing expenditures),

- recession therapy (general decrease in prices, differentiation of products for purchasers, convenient systems of payments for purchasers),
- preventing operations (diversification of company's operation in order to make it more stable).

## 6. Results of research

Proposals of selection of a marketing strategy option were based on the following baseline criteria:

- A concentration level of a sector (level of the branch development with taking into account diversification of a level of concentration of production and assets according to different branches,
- Market development phase (level of market saturation by particular product category),
- level of processing of a product taking into account the division into:
  - traditional offers (of a low level of processing),
  - offers of new generation (of a high level of processing).

Basing on the above mentioned criteria it should be stated that the dairy industry and the industry of edible fats are characterized by the relatively high level of concentration, where about 70% of the market is controlled by the five largest firms. On the other hand, the meat industry is characterized by the lower level of advancement in production and assets concentration, although there was radical increase in advancement in production and assets in the end of 90' and contemporarily the four largest firms have gained 56% of the market.

In the framework of food industry there were selected the following branches for segmentation research: dairy, meat and edible fats [Szwacka-Mokrzycka 2011, SMG/KRC 2013].

The analysis of tendencies in consumption of products selected to research indicates dynamic development of "new generation" categories on the Polish market, so dairy drinks and desserts. The market of dairy drinks and desserts is characterized by a relatively low level of saturation. This last statement concerns especially the market of dairy drinks (table 1).

Table. 1 Tendencies of dairy desserts consumption in the period 1998-2012 (%)

1998-2012	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
27,78	21,50	25,20	25,70	29,50	30,20	X	23,91	24,14	27,36	28,89	28,60	28,08	29,81	30,49	27,80

Source: tables 1-11: own elaboration on the base of SMG/KRC 2013.

x- unavailable

The market of dairy drinks is characterized by a lower level of penetration, although a higher rate of growth than the described above market of dairy desserts (table 2).

Table 2. Tendencies of dairy drinks consumption in the period 1998-2012 (%)

1998-2012	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
26,45	14,30	15,40	17,10	23,90	31,30	X	26,74	27,73	31,89	31,50	28,95	28,08	27,66	28,23	28,18

x- unavailable

At the same time it should be noticed that the market of yoghurt was characterized by significant fluctuations over time. The period 1998-2002 brought considerable increase in consumption of yoghurts, whereas decline to the level from 1998 was noticed in the next years (table 3).

Table 3. Tendencies of yoghurt consumption in the period 1998-2012 (%)

1998-2012	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
78,63	78,00	83,00	81,00	80,10	81,00	X	73,70	71,43	76,79	76,89	78,06	75,04	76,72	76,55	75,94

x- unavailable

Conducting the analysis of the meat market from the demand side, there should be noticed a high and quite stable position of meat in the consumption structure. This decreasing tendency of meat consumption concerns mainly beef, whereas there was increase in consumption of poultry and premium sorts of meat (veal and lamb). Meat and processed meat are a category, which represents a group of necessities characterized with a high level of food needs saturation. The penetration level of this market was very high over the analyzed period, with the average level of 97,18% in the researched period (table 4).

Table 4. Tendencies of meat consumption in the period 1998-2012 (%)

1998-2012	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
97,18	98,10	97,90	97,70	97,10	97,10	X	97,64	97,33	97,88	97,58	97,66	97,18	97,49	97,55	97,18

x- unavailable

Detailed analysis of the edible fats market indicates that an average consumption of margarines for spreading on bread was on the level of 66,46% in the period 1998-2012. This market is characterized with some fluctuations over time. A significant breakdown in consumption of margarines took place in the period 2001-2002 but its increase took place in the next years to the volume of the base period, 1998 (table 5).

Table 5. Tendencies of margarine for spreading on bread consumption in the period 1998-2012 (%)

1998-2012	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
66,46	67,00	64,00	64,00	62,00	62,00	X	68,36	67,63	66,96	67,85	66,48	66,56	67,34	67,52	67,79

x- unavailable

The market of margarines for roasting/frying is characterized by a higher level of penetration than margarines for spreading on bread. Nearly 70% of customers declared their consumption in the period 1998-2012 (table 6).

Table 6. Tendencies of margarine for roasting/frying consumption in the period 1998-2012 (%)

1998-2012	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
72,25	79,20	75,80	70,50	71,00	71,80	X	65,92	65,59	69,04	68,19	x	67,71	67,67	66,46	64,41

x- unavailable

The relatively highest level of penetration on the market of edible fats took place on the market of oil and olive. In the period 1998-2012, on average 96,5% of customers declared their consumption (table 7).

Table 7. Tendencies of oil and olive consumption in the period 1998-2012 (%)

1998-2012	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
96,47	97,40	97,00	96,00	96,40	96,40	X	96,05	96,03	96,59	96,91	97,10	96,57	96,75	96,24	95,84

x- unavailable

Contemporary, the variable of “searched benefits” has been occurring more and more important in typology marketing strategy. Consequently, providing customers with a “set of benefits” according to their expectations is the base of distinguishing market segments. Benefits searched by a purchaser concern high quality associated with the brand by customers and connected with a purchase of a product of a low price.

Table 8. Orientation level of dairy desserts customers on the price and brand of the product in 2009 and 2012

<b>Orientation level</b>	<b>2009</b>	<b>2012</b>
<b>Price oriented</b>	93	110
<b>Brand oriented</b>	111	91

Value > 100 – means increase in relation to basic index – 100%

Value < 100 – means decrease in relation to basic index – 100%

The analysis of the level of the price and quality indices is very important from the perspective of decomposition of purchasing preferences towards the price and quality (brand) of the product. The analysis of indices was conducted basing on associations of purchasers connected with particular brand. It allowed to diagnosing to what extent the customer valued the brand and price of the product.

In the period 2004-2009 a process of diversification of customers distinctly oriented on the quality of the product was progressing. In the 2010-2012 had been changing – the level of price orientation was increased. The dairy desserts market is characterized by the relatively lowest saturation level among other researched categories (27,8% of customers declared their consumption in the period 1998-2012).

The segmentation analysis based on the criterion of searched benefits indicates lower level of customers’ orientation on the product brand on the market of dairy drinks than dairy desserts. The relatively high level of customers’ orientation on the brand is proved by calculated indices (108 in 2009 (table 9). Furthermore, it should be noticed that increase in purchasing loyalty of customers of more expensive dairy drinks brands took place in the period 1998-2009. In the 2010-2012 the tendency had been changed – we observed the increase the loyalty of price oriented customers (table 9).

Table 9. Orientation level of customers of dairy drinks on the price and brand of the product in 2009 and 2012

<b>Orientation level</b>	<b>2009</b>	<b>2012</b>
<b>Price oriented</b>	98	106
<b>Brand oriented</b>	108	94

Value > 100 – means increase in relation to basic index – 100%

Value < 100 – means decrease in relation to basic index – 100%

The yoghurt market was characterized by the high level of customers’ orientation on the brands: Bakoma, Ostrowia, Zott, and Danone in 1998-2009. The comparative analysis of the



results of research from the periods 1998-2009 and 2010-2012 displays deepening of orientation of customers oriented on price segment (Szwacka-Mokrzycka 2013 and table 10).

Table 10. Orientation level of customers of yoghurts on the price and brand of the product

<b>Orientation level</b>	<b>2009</b>	<b>2012</b>
<b>Price oriented</b>	94	109
<b>Brand oriented</b>	111	94

Value > 100 – means increase in relation to basic index – 100%

Value < 100 – means decrease in relation to basic index – 100%

Meat consumption is especially connected with the segment of older people, so aged more than 45 years (43,06%); however the proportion of young people in its consumption was significant in the period 2003-2012 – on the level of 20,95% [SMG/KRC 2013]. Further, it should be stressed that it is the segment oriented on qualitative customers, which is proved by the high indices in 2009 – 112 and orientation of customers on price in 2010-2012 (table 11).

Table 11. Orientation level of customers of meat on the price and quality of the product in 2009 and 2012

<b>Orientation level</b>	<b>2009</b>	<b>2012</b>
<b>Price oriented</b>	97	106
<b>Brand oriented</b>	112	82

Value > 100 – means increase in relation to basic index – 100%

Value < 100 – means decrease in relation to basic index – 100%

As far as the segmentation analysis based on the benefits searched by purchasers is concerned, a high level of purchasers' orientation on the product brand should be noticed on edible market (table 12). From 2010 year it had been observed considerably higher indices of customers oriented on the price of the product (table 12).

Table 12. Orientation level of customers of margarine for spreading on bread on the price and quality of the product in 2009 and 2012

<b>Orientation level</b>	<b>2009</b>	<b>2012</b>
<b>Price orientem</b>	96	109
<b>Brand orientem</b>	112	93

Value > 100 – means increase in relation to basic index – 100%

Value < 100 – means decrease in relation to basic index – 100%

As far as the segmentation analysis based on benefits searched for customers is considered, there should be displayed a high level of customers' orientation on quality on the margarine for roasting/frying market till 2009. This tendency had been changed in

2010-2012 on price orientation, which is proven by the high index calculated – 109 (table 13).

Table 13. Orientation level of customers of margarines for roasting/frying on the price and brand of the product in 2009 and 2012

Orientation level	2009	2012
Price oriented	98	104
Brand oriented	110	92

Value > 100 – means increase in relation to basic index – 100%

Value < 100 – means decrease in relation to basic index – 100%

## 7. Proposals of marketing strategies selection basing on determined criteria

The first group of marketing strategies based on the criterion of product-market. The strategies of product-market approach can be divided into: strategy of market penetration, strategy of market development, strategy of product development, and strategy of diversification (innovation). There are possibilities of wider use of strategies of market penetration and development [Szwacka-Salmonowicz 2003, Szwacka-Mokrzycka 2011, Szwacka-Mokrzycka 2013]. Penetration strategies based on intensification of products' sale on hitherto serviced markets can be implemented for categories with relatively high market potential and relatively low level of needs saturation. It concerns the category of new generation. Penetration activities should be focused mainly on the segment of young people, who decide on boosting of changes in consumption patterns on this market. Realization of the strategy of market development should be based on possibilities of its widening, mainly through demographical and territorial context. A possibility of widening the market of traditional processed products through boosting development of consumption in small towns and villages has become especially important in this context from the strategic point of view. Flexibility of companies' adjustment to changing market conditions is determined to a large extent by the firm's position on the market. In the case of big firms, developed diversification strategies can be implemented, which are connected with a necessity of larger material and capital input. They allow to building a durable market position on the market through positioning in different segments (both standard as well as brand products). Companies of a relatively lower position on the market will realize to a larger extent strategies of penetration and market development .

The next described group of marketing strategies consists of strategies of influencing on purchasers. Selection of the strategy of influencing on purchasers is connected with determination of: general character of values offered for purchasers, rate of market cover and differentiation of marketing operations, product position towards preferences of purchasers [Szwacka-Salmonowicz 2003, Szwacka-Mokrzycka 2011]. Research results allowed to determination of possibilities of implementation of strategies of influencing on purchases on the selected food markets. In view of research results it can be concluded that qualitative preferences play the key role on the market of new

generation categories. To the contrary, concentration on price strategies is recommended on the market of traditional categories.

The next recommended group are strategies of cooperation with partners in the field of distribution. Both producers as well as traders are interested to a different extent in forming and control of functioning of marketing channels, which include marketing processes consisting of information exchange, transaction processes, and physical flow of goods. This diversification of approaches of producers and traders displays in active or passive participation in the field of cooperation with market partners. An active approach of a producer displays through determination of an own marketing strategy including forming of distribution channels. Therefore, trade companies play a role of a participant in a producer's distribution system, which assures efficient implementation of marketing process on a way to a final purchaser. On the other hand, a passive approach of a producer displays through perceiving a trade company as a client, which has its own supplying needs resulting from knowledge of final customer's market. Strategies of cooperation with partners in the field of distribution are recommended especially at the dairy and fats market.

The final recommended group are competitive strategies. It is worth to mention that particular branches of the food industry in Poland are in the phase of increase or growth. It is confirmed by the high level of market saturation in relation to majority food products and high promotion of companies product assortment. The base for creation a competition strategy in such sector is price (on traditional product categories) and brand image. (new-generation product categories). So that the first proposal points the strategy of the lowest costs and prices, especially for large companies, which benefit from economy of scale (high turnover and market share and low retail prices). This option is recommended when the potential of market is high and a company can implement advanced technologies. This situation is characteristic for secondary processing of food and compound products. Next proposal is connected with a differentiation strategy. This option is based on variability and high quality product assortment and brand image. The differentiation strategy is recommended for producers of new generation dairy products, oils and juices. Application of this strategy lets to create a quasi-monopolistic position of brands in chosen segments.

## **8. Conclusions**

Presented results of research allowed to determination of possibilities of implementation of marketing strategies on the selected food markets. There are possibilities of wider use of strategies of market penetration and development. Penetration strategies based on intensification of products' sale on hitherto serviced markets can be implemented for categories with relatively high market potential and relatively low level of needs saturation. The next proposal is strategy of influencing on purchasers. On the market of new generation categories is recommended the strategy of qualitative preferences. To the contrary, concentration on price strategies is recommended on the market of traditional categories. The next recommended group are strategies of cooperation with partners in the field of distribution, especially at the dairy and fats market. The next proposal points strategy of the cost leadership, especially for large companies, which benefit from

economies of scale. This option is recommended when the potential of market is high and company can implement advanced technologies. The associated distribution strategy is to obtain the most extensive distribution possible. This strategy is recommended for secondary processing food, multicomponent products. Next proposal is connected with differentiation strategy. Differentiation strategy is recommended for producers of new-generation dairy products, oils and juice, where the firms take advantage of improvement and innovation.

## References

1. Brogowicz Andrew A., Grashof John E., McCarthy E. Jerome. (1984): Basic Marketing. Richard D. Irwin, Inc. Homewood. Illinois 60430.
2. Garbarski L. (2011): Marketing. Koncepcja skutecznych działań. Polskie Wydawnictwo Ekonomiczne, Warszawa [in Polish].
3. Gierszewska G., Romanowska M.(2000): Strategic Company's Analysis. PWE, Warszawa [in Polish].
4. Kotler Ph. (1994): Marketing. Analiza, planowanie, wdrażanie i kontrola. Wydawnictwo Gebethner i S-ka. Warszawa [in Polish].
5. Mruk H.(2008): Strategie konkurowania na rynku produktów spożywczych, Przemysł Spożywczy, nr 8, Warszawa [in Polish].
6. Niestrój R.(1999): Marketing Management. PWN, Warszawa [in Polish].
7. Oblój K.(1998): Strategy of a company. PWE, Warszawa [in Polish].
8. Porter M.F.(1979): How competitive forces shape strategy. Harvard Business Review, March/April.
9. Porter M.F.(1980): Competitive Strategy: Techniques for Analysing Industries and Competitors. Free Press, New York.
10. SMG/KRC Millward Brown Company (2013): Results of segmentation research. Warsaw [in Polish].
11. Szwacka-Salmonowicz J. (2003): Zmiany zachowań nabywców jako determinanta kształtowania strategii segmentacyjnych przedsiębiorstw przemysłu spożywczego w Polsce. Wydawnictwo SGGW, Warszawa [in Polish].
12. Szwacka J.(2005): Directions of competition strategies creation of food-industrial companies after Polish accession to UE. AE,Wrocław [in Polish].
13. Szwacka J. (2007): Competitive Forces and its Implications for Strategy Shaping of Food Industry in Poland, Proceedings of the 8 th International Conference of the Faculty of Management Koper, University of Primorska, Portorož, Slovenia [in English].
14. Szwacka-Mokrzycka J. (2011): A study on food brand. University of Life Sciences Press. Warsaw [in English].
15. Szwacka-Mokrzycka J. (2013): Tendencje rozwojowe popytu i podaży żywności w Polsce. Wydawnictwo SGGW. Warszawa [in Polish].
16. Treacy M., Wiersma F.(1995): The Discipline of Market Leaders: Choose Your Customers, Narrow Your Focus, Dominate our Market, Addison Wesley Publishing Company.
17. Urban R. (2008): Food Industry in Poland in 2008. Report IERiGŻ, Warszawa [in Polish].

### Informacje o autorze:

**Joanna Szwacka-Mokrzycka**  
Warsaw University of Life Sciences  
Nowoursynowska 166, 02-787 Warsaw  
e-mail: jesm54@wp.pl