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ASSESSMENT OF EMBEDDING RELATIONSHIPS OF AGRICULTURE HOLDINGS` WITH INDUSTRIAL ORGANIZATIONS

Key words: embedding relationships, industry and geographical embeddedness, industry organisations, conservation breeds

ABSTRACT. The aim of the research was to assess the relationship of farms with industry organizations (IOs) in terms of the phenomenon of embedding (industry and geographical). The occurrence of the embedding features of relations was considered in the context of obtained economic features of farms, such as: sales, direct costs, percentage of contracting. Using an interview questionnaire, the research was conducted on a purposive sample of 145 holdings keeping breeding animals of conservation breeds (cattle, pigs, and sheep) and the industry organisations cooperating with them in south-eastern Poland. The quality of the relationships that shape the embeddedness was assessed using multiple step regression in groups by industry and geographic location. The results indicate the potential for increased economic efficiency with industry embeddedness of pig farms. The most important feature of the industry setting influencing the increase in sales contracting was the power of dependence in the relationship (the greater the dependence in the relationships, the greater the sales contracting). In the analyzes of the relationships representing the geographical setting, the most significant positive impact was the high rating of the "quality of communication" feature, the presence of which contributed to the reduction of direct costs of farms. Relationships between farms and industry organizations can be industry-specific and geographically embedded, and „rooting effects" should always be critically analyzed and not treated as a unique, distinguishing feature.

INTRODUCTION

Interest in the embeddedness (colloquially: entanglement) of the relationships formed by conservation breeds holdings and industry associations stems from the needs of theory and practice. Embeddedness, defined in the social sciences as the interdependence and constraint of activities [Andersson et al. 2005, p. 31, Polanyi 1944, cited in Ratajczak-

Mrozek 2017a, p. 11], can bring many positive effects, such as access to valuable resources, knowledge, information, people (interpersonal contacts), reduction of transaction costs. Identifying conditions for creating inter-organisational embeddedness through the cooperation of conservation breeds livestock breeders and industry organisations (farmers with institutions) fills the cognitive gap in terms of relational variables responsible for the development of bio-business[1]. As confirmed by previous research, inter-organisational relationships and their embeddedness in networks can also enable the dictation of prices and product quality standards and increase demand for products [Ciesielski 2013, p. 77]. Networking is possible wherever the products provided by different producers are homogeneous – this creates a potential for organising. Thus, it applies to agricultural production. Farmers' machinery rings, production cooperatives, or processors' agreements are the best examples of the incidence of cooperation potential of perfect competition, according to Marek Ciesielski [2013, p. 82].

Agricultural holdings keeping breeding animals of conservation breeds (HKBACB) (HMCBA) contribute to the development of biodiversity. Industry associations play an essential role in the agribusiness network. According to the Act on socio-professional organisations of farmers [Journal of Laws 1982.32.217, Journal of Laws 2022.281], guided by concern for the nutrition of Polish society, they fulfil representative tasks and decide on matters related to the development of individual farms and social progress in the countryside.

RESEARCH OBJECTIVE AND METHODS USED

From a theoretical perspective, the embeddedness of the institutions' relationship with agricultural holdings keeping breeding animals of conservation breeds (HKBACB) may determines the conditions for cooperation and, thus, the development opportunities of the farms. The above assumption is confirmed by the positive effects of imprisonment (described later in the article). The research aim to assess the relationship of farms with industry organizations in terms of the phenomenon of settlement (industry and territorial). As part of the main objective, the influence of industry organizations on the conditions for the development of farms in the perspective of embedding relations within their network of connections was determined. The studied network shows features of openness (any farmer can join), with a high degree of settlement (the farmer undertakes to comply with the rules of membership and undergo monitoring procedures in order to keep animals of conservative

[1] Bio-business is a term broader than agribusiness, it covers those economic spheres in which the production, distribution, exchange and consumption of biological resources in the economy takes place [Urban, Piwowar 2016, pp. 177-178]. In the article, bio-business represents the genetic resources of conservative breeds of farm animals owned by farmers and subject to exchange not only on the market.

breeds in order to maintain subsidies), but also a different degree of embedding in all of this nets (depending, inter alia, on the size of the herd). A research question was asked whether industry organizations (IOs) moderate the conditions of economic development of HKBACB, embedding relations in the sector and territorial perspective? To model the embedding relations, a progressive multiple regression stepwise ($y = b_0 + b_1x_1 + b_2x_2 + ... + b_kx_k$)[2] was used, in which the independent variables (IV) were the characteristics determining the relations, and the dependent variables (DV) – economic values from farms (sales, costs direct, sales contracting). Stepwise regression analysis allowed us to identify the variables that had the most significant impact on the dependent variable (economic variables) from the list of 15 explanatory variables (x_1-x_{15}). Answers to the following questions were sought:

1. How the features of the embedding relations of agricultural holdings maintaining conservation breeds animals relations with IOs affect the economic performance of farms in the industries (pigs, cattle and sheep)?
2. How do the economic results of HKBACB farms cooperating with industry organizations (IOs) depend on the embedding features of the relationship?
3. Does the total embeddedness of the surveyed farms affect contracting, income, net added value, direct costs or sales?

Modeling consisted in looking for a set of characteristics of the relations between farms and industry institutions, most importantly shaping economic effects. From the set of 15 relationship features, the models with the best fit (with the highest R^2) included features that significantly influenced the results of farms. Embedding based on the features of relations (relational dimension) is a methodological solution used in determining the phenomenon, in addition to the structural and positional dimensions. In the adopted solution, the enterprise (or a farm) was analyzed in the context of relations (connecting actors, resources and activities at the same time) and positions occupied in the network of relations, which can be referred to as three dimensions of embedding. With regard to this concept, an enterprise may be embedded in various types of relationship networks (not only interpersonal, as Marc Granovetter stated) [Ratajczak-Mrozek 2014, p. 58]. The problem of the complexity of embedding as a contextual phenomenon requires simplification and encourages modeling. The regression analysis results and determinations were obtained from the Statistica program.

The subject of the research was the relationship of farms (HKBACB) with industry organisations. Using questionnaires, research was conducted in three provinces: Małopolskie, Podkarpackie, and Lubelskie. The selection of entities was deliberate. The condition for selecting the sample of farms was the official keeping of conservation breeds livestock (pigs, cattle, sheep). On the other hand, industry organisations were selected based on declared membership by farm holders. Altogether 145 farms and 13 actively cooperating industry organisations that the farms were members of were surveyed.

[2] Multiple regression formula with estimates of the regression coefficient ß [Stanisz 2007, p. 59].

The attached results are a sample of the data collected within the NCRD Biostrateg project[3]. The study of the relationships that may determine any embedding effects required checking the quality and selection of the most important affecting the economic results of the farms. 15 variable[4] features of the embedded relations were assumed: x_1 – years of collaboration, x_2 – strength of dependence, x_3 – uniqueness of connections, x_4 – frequency, x_5 – interdependence, x_6 – infinity, x_7 – opportunism, x_8 – trust, x_9 – compatibility of partners, x_{10} – support in relationships, x_{11} – sharing of gains and losses, x_{12} – commitment, x_{13} – joint action, x_{14} – quality of communication, x_{15} – sharing of information. The economic dependence of the agricultural holdings maintaining conservation breeds animals (DV – dependent variable) results on the embeddedness characteristics (IV – independent variables) was determined by progressive multiple regression analyses [Krippendorff 1986, Moore, Weatherford 2001].

The research presented here adopted the embeddedness concept of Ulf Andersson et al. [2001, 2005], was adopted, based on the characteristics of relations, according to which embedding intensifies with an increase in the assessments of relational features, e.g. with an increase in trust, adaptability and reciprocity. It was assumed that an increase in the assessment of the characteristics of the relationship x_1-x_{15} (except for opportunism x_7) increased the embedding of the relationship.

EMBEDDEDNESS

Embeddedness is a concept originating in sociology, introduced by Karl Polanyi [1944], indicating constraints on activity caused by non-economic institutions. The concept of embeddedness was developed and popularised by Mark Granovetter [2018], who perceived enterprises' behaviour and activities as embedded in networks of personal relationships.

Since the introduction of the concept of rooting in the field of social sciences, it has been adopted by other disciplines (organization management, business studies, economic geography). Social researchers pointed out that most behavior is tightly embedded in networks of interpersonal relationships, which was in contradiction to classical and neoclassical economics, which indicated an atomized, unsocialized concept of human action [Granovetter 1985, Block 1990, Granovetter 1990, Mingion 1991]. It was only since 1970 that there was a strong interest in the previously neglected issues of trust and abuse (typical features of relationship embedding) among economists. The breakthrough took

[3] The publication concerns the BIOSTRATEG2/297267/14/NCBR/2016 project, funded by the National Center for Research and Development under the Biostrateg program entitled „Directions for the Use and Conservation of Livestock Genetic Resources in the Conditions of Sustainable Development".

[4] In the questionnaire, the respondents assessed the characteristics of the x_1-x_{15} relationship on a scale of 1-5 (1 – min, 5 – max).

place thanks to the institutionalist Oliver Williamson, who provoked interest in relational issues, asking the research question under what circumstances economic functions are performed within the boundaries of hierarchical companies, and not by market processes that cross the boundaries of enterprises [Granovetter, Svedberg 2011].

Relationship embeddedness can be analysed in the context of networks of relationships [Halinen, Törnroos 1998] and the specific characteristics of the relationship [Andersson et al. 2001], determining the efficiency of the actions of the actors involved [Ratajczak-Mrozek 2017b]. The economic efficiency of embedding the relations of HKBACB farms is one of the most expected results in the assessment of a phenomenon that may have positive (rewarding for trust) and negative consequences (punishing for disloyalty). Embedding relationships within a network is accompanied by both potential benefits (e.g. larger market, development potential) and negative effects (the need to act alongside global players despite the lack of preparation). Katarzyna Czernek and Maciej Mitręga [2016], while examining the tourist network, indicated: opportunity costs, the dominance of interpersonal obligations, the domino effect, interpersonal tensions and opportunistic behavior as negative effects of being rooted in the network. As noted by Milena Ratajczak-Mrozek [2014, pp. 56-57], there is a tendency to limit ourselves in research to considering the positive impact of detention. Negative effects are usually analyzed in the context of factors negatively affecting relations, and not – relations enterprises [Biggemann, Buttle 2006, Signorini, Paliwoda 2012, Thomas et al. 2010].

The rationale behind the research problem addressed (embeddedness *versus* economic performance of the entangled actors) was the assumption that there are patterns of connections (partnership relationships) arranged around nodes in a network. The network is formed by regular collaborative relationships between agricultural holdings maintaining conservation breeds animals and industry organisations. In this case, the nodes are the industry organisations (IOs), which create the conditions for development and are an essential part of the institutional environment for breeders. The formation of farmers' relationships mainly with industry organisations confirms the absence or rarity of other forms of cooperation, such as agricultural producer groups. The deficit of organised forms of cooperation creates a situation where the industry organisations are the integrator for generating contracting for raw material and "embeds" farmers formally. Embeddedness is a complex phenomenon and can be observed in a variety of situations. Most of the research on embedded context has focused on social networks and institutional contexts, paying little attention to the spatial (geographic) context [Hindle 2010, Welter 2011]. The article considers the context of the conditions of embedding due to the industry (represented by the partner institution) and the geographical location of farms, recognizing that the conditions and specificity of agricultural production play an important role in creating the embedding of agro- and bio-business relations (regionalization and specialization of production, industry differentiation in integration processes).

BRANCH ORGANISATIONS OF LIVESTOCK PRODUCERS IN POLAND

Alongside agricultural chambers, agricultural trade unions and producer organisations, socio-professional organisations of farmers play an essential role in representing farmers' interests in relation to state and local administration [Sikorska-Lewandowska 2016, p. 175]. Due to the aim of the research, as well as the extensive target group of all industry organisations, the paper will focus on three industry organisations (POLSUS, PFHBiPM – FCBMP and PZOw – PUSF) representing the surveyed breeders of pig, cattle, and sheep conservation breeds existing in south-eastern Poland. These organisations create development conditions for their members through training, marketing activities, and contracting. Thus farmers are involved by being provided with opportunities to participate in training offers and promotional initiatives and by contracting the sale of raw materials. The origin of trade unions and associations in agriculture dates back to before the First World War. The possibilities for farmers to associate arose only after the peasants were freed from serfdom, which varied in time and in particular partitions [Wawrzyniak 2021, p. 61]. Industry organizations are one of the forms of rural self-government units, a form of entrepreneurship, contributing to the multifunctional development of villages [Bieńkowski 2004]. According to Bogdan Wawrzyniak [2021, p. 77], the directions of development of trade associations in agriculture should be considered in the light of changes in the structure of agricultural production.

RESULTS

A review of the literature and research under the BIOSTRATEG2/297267/14/NCBR/2016 project confirm that farms keeping breeding animals of conservation breeds are embedded in specific social relations and production conditions, adjusting their practices, rites, resources to characteristic standards for a given location and industry. The conducted analysis of multiple regression models concerned the relational dimension of embedding (next to the dimensions: structural and positional), which meant that it depended on the quality of the relationship between farms and industry organizations.

The impact of features of embedding relations on farm performance was assessed by conducting multiple regression analyses (IV → DV, embedding features (IV) → sales/contracting/income/net value added/direct costs (DV). Multiple regression analysis identify relational variables of embedding (individually and collectively) that influence farm economic performance. The results of the regression analyses were used to model the determinants of embeddedness in the industry and geographical approach. In each case, the best-fitting models were selected (according to the coefficients of determination R^2 from Tables 1 and 3), and the relationships of the relational variables responsible for the economic performance of the embedded entities (farms) were traced.

Relational variables relating to industry and geographic embedding from the best-fit regression models (Tables 2 and 4) differ (6 variables each, including 2 repeating variables), which results from statistical analyzes rejecting uncorrelated relationships of independent variables (relationship features) with the dependent variable (economic variable). Otherwise, progressive multiple-step regression models (after the last step in the form of a function under Tables 2 and 4) present optimal conditions in terms of the quality of the relationships of selected variables. In the final model, there are only relational variables that best describe the dependent variable (sales, direct costs). With selected variables (IV) there is a change in economic variables (DV, e.g. sales, direct costs).

The fit (R^2) of the industry embeddedness relationship regression models ranged from about 9% to 89% (Table 1). The weakest fitted model was at $R^2 = 0.03$ and was formed by sheep-keeping farms with industry organisation and the dependent variable: sales (Table 1). The best-fitting model was formed by industry organisations with pig farms with the dependent variable: sales ($R^2 = 0.78$ – Table 1). In economic practice, the industry organizations distinguished in modeling are represented by: POLSUS and the Polish Union of Sheep-Farmers (PUSF). POLSUS is an organization with many years of operation (since 1958), distinguished by its commitment to contracting the sale of pigs, supporting the breeding of the conservative pig breed "Puławiak". The unrecognized organization of the third industry – the Federation of Cattle Breeders and Milk Producers (FCBMP) has been operating for the shortest time on the market (since 1989), and PUSF has been operating for a slightly longer period (since 1986)[5].

Table 1. Coefficients of determination (R^2) of embeddedness models of cattle, sheep and pig farm relationships with industry organisations (IOs)

Specification	Dependent variables				
	% of contracting (y_1)	income with (y_3)	added value net (y_4)	direct costs (y_5)	sales (y_6)
Various R^2_cattle	0.1802	0.1970	0.1628	0.2235	0.3529
Various R^2_sheep	0.1689	0.1078	0.0447	0.0678	0.0284
Various R^2 pigs	0.6584	0.2815	0.5348	0.7771	0.7801

Source: own study

[5] Information on the described industry organizations comes from official websites (POLSUS, PZOw – PUSF, PFHBiPM – FCBMP).

Table 2. The results of the estimation of the parameters of the regression model describing sales, taking into account the features of the relationship between the embedding of industry organizations and pig farms

Specification	b* Beta (normalized value parameter next to the variable)	Standard error b*	b Parameter next to the variable	Standard error b	Statistics t	p
Absolute term	-	-	634,727	153,086.6	4.14619	0.001356
Power of dependence	1.205623	0.216680	110,045	19,777.7	5.56407	0.000123
Uniqueness of connections	-0.812700	0.218879	-174,220	46,921.4	-3.71301	0.002964
Opportunism	0.076517	0.236739	8,631	26,705.1	0.32321	0.752098
Frequency	0.413294	0.164112	19,287	7,658.5	2.51837	0.026990
Profit and risk sharing	-0.509053	0.191108	-68,625	25,763.2	-2.66370	0.020650
Trust	-0.680805	0.289377	-88,914	37,792.9	-2.35266	0.036536

Dependent variable regression summary: Total sales PLN, R= 0.88327432, R^2 = 0.78017353, Correct. R^2 = 0.67026030, F(6, 12) = 7.0981, p < 0.00208, Estimation standard error: 1,180E^2

Source: own study

Multiple regression equation [Stanisz 2007, p. 59]: $y = b_0 + b_1 x_1 + b_2 x_2 + ... + b_k x_k$ in a descriptive form according to the results from Table 2:

$$IO\ pigs_{Sales} = 634{,}727 + 110{,}045\ Power\ of\ dependence - 174{,}220\ Uniqueness\ of\ connections + 8{,}631\ Opportunism + 19{,}287\ Frequency - 68{,}625\ Profit\ and\ risk\ sharing - 889{,}114\ Trust$$

In the model best-fit model with the pig industry organization (POLSUS), the number of independent variables (explaining the embedding of the relationship) was six (dependency strength, uniqueness, opportunism, frequency, profit and loss distribution = risk in the relationship, trust), including 2 features significantly influenced in plus, 3 features in minus and 1 feature (opportunism) insignificantly positive. The 9 rejected variables in regression analyzes of industry embedding included: years of cooperation, frequency, interdependence, partner compliance, relationship support, commitment, joint activities, communication quality and information sharing. All model variables, except opportunism,

significantly impacted embeddedness (Table 2). The most substantial positive significant impact was: relationship strength (110,045) and relationship frequency (19,287). The uniqueness of connections trait showed the most substantial negative significant impact on embeddedness (-174,220). This means that with the increase in the ratings by one degree: the strength of dependence in relationships and the assessment of the frequency of relationships with industry organizations, the sales of farms increased by PLN 110,045 and PLN 19,287, respectively. The results may indicate a great importance of the relationship (entanglement) in the shaping of sales revenues of the researched farms. The strongest negative significant influence on imprisonments was shown by the feature: the uniqueness of connections (-174,220). The unexpected negative function of the "trust" feature in the model of industry embedding requires interpretive caution[6] and in-depth research, justifying the negative impact on farm sales. Trust should not be eliminated from the relationship at the expense of economic results, as this leads to the loss of the value of human capital.

For the analyses of geographical embeddedness (from the evaluations of 15 features), the best-fitting models for industry organisations were selected ($R^2 = 0.43173482$ – Table 3). A breakdown of the degrees of fit by R^2 of all total embeddedness with industry organisation models for farms is presented in Table 3. The fit (multivariate R^2) of the geographic relationship embeddedness models ranged from approximately 7% to 40%. The weakest fitting model was at the level of $R^2 = 0.0693$ in Podkarpackie Voivodship formed by industry organisation with the direct costs dependent variable (Table 3). The best-fitting model was also an industry organisation for the dependent variable direct costs, but from the Małopolskie Voivodship ($R^2 = 0.4317$ – Table 3).

Table 3. Coefficients of determination (R^2) of models of geographical embeddedness of farm relations with industry organisations in three voivodships

Voivodships	Dependent variables				
	% of contracting (y_1)	income with subsidies (y_3)	added value net (y_4)	direct costs (y_5)	sales (y_6)
Lubelskie	0.3507	0.3682	0.3535	0.3281	0.3605
Podkarpackie	0.3307	0.1416	0.1823	0.0693	0.4024
Małopolskie	0.2674	0.2129	0.0916	0.4317	0.3994

Source: own study

[6] Andrzej Stanisz advises that in an analogous case, "at the beginning, use automatic variable elimination (stepwise regression), in order to later modify the model according to common sense" [2007, p. 166].

Table 4. The results of the estimation of the parameters of the regression model describing the direct costs, taking into account the features of the relationship between the settlement of industry organizations and pig farms in the Małopolskie Voivodeship

Specification	b* Beta (normalized value parameter next to the variable)	Standard error b*	b Parameter next to the variable	Standard error b	Statistics t	p
Absolute term	-	-	-2,247.5	14,278.99	-0.15740	0.875722
Frequency	0.500474	0.145468	2,937.4	853.78	3.44044	0.001372
Power of dependence	0.432421	0.219466	5,138.9	2,608.15	1.97034	0.055749
Years of cooperation	-0.285573	0.198339	-963.2	668.95	-1.43983	0.157697
Compatibility of partners	0.262116	0.227671	6,541.1	5,681.50	1.15129	0.256448
Quality of communication	-0.652260	0.292501	-15,205.6	6,818.86	-2.22994	0.031430
Commitment	0.510384	0.298481	11,897.1	6,957.61	1.70994	0.095025

Dependent variable regression summary: Direct costs: $R = 0.65706531$, $R^2 = 0.43173482$, Correct $R^2 = 0.34649504$, $F(6, 40) = 5.0649$, $p < 0.0060$, Estimation standard error: 20,961.

Source: own study

Multiple regression equation [Stanisz 2007, p. 59]: $y = b_0 + b_1 x_1 + b_2 x_2 + \ldots + b_k x_k$ in a descriptive form according to the results from Table 4:

$$DC_{Małopolskie} = -2,247.5 + 2,937.4\ Frequency + 5,138.9\ Power\ of\ dependence - 963.2\ Years\ of\ cooperation + 6,541.1\ Compatibility\ of\ partners - 15,205.6\ Quality\ of\ communication + 11,897.1\ Commitment$$

In the best-fitting model of geographical embeddedness with industry organisation, the number of independent variables (explaining the relationship embeddedness) was also six. Two variables had a significant impact on geographical embeddedness in the Małopolskie Voivodship: positive: frequency (853.78) and negative: quality of communication (-15,205.6 – Table 4).

The results obtained in the context of the research by Milena Ratajczak-Mrozek [2017a, p. 19], who showed the impact of the level of relationship features: adaptation, trust, reciprocity (or the power of dependence) on the improvement of the results of micro

and small enterprises, find some confirmation for the industry setting, with in which the "dependency power" feature significantly influenced sales in farms in relations with the industrial organizations (IOs).

CONCLUSIONS

The conducted research on relations showed sets of relational variables considered to be embedding, which influence the economic results of farms. The relationships established with the participation of industry organizations, which through statutory activities (promotional, educational, representation) are jointly responsible for the state of network relations with farms, were considered. In the group of three analyzed sectors (pigs, sheep and cattle), the organization of pig producers "POLSUS" was distinguished due to the best suited model of embedding relations, which was adopted for further analyzes.

In development activities for cooperation embedding IOs relations with agricultural holdings maintaining conservation breeds animals (HKBACB), it is necessary to strengthen the power of dependence (e.g. by contracting production for members of branch associations) for pig industry embeddedness and to increase the frequency of association members' meetings (especially in terms of geographical embeddedness in the Małopolskie Voivodeship). The results confirm the dependence of the modelling of geographical embeddedness on the location of farms. The impact of embeddedness on the formation of direct costs of farms was weak in the Podkarpackie and strong in the Małopolskie Voivodship.

The role of the industry associations in the context of supporting the effectiveness of the embeddedness of the relationship is, among others, to evolve towards lobbying, as well as to define common priorities, strengthen cooperation, and standardise positions on the issues that are crucial for the future of the industry. Further continuous training of the industry organisations' representatives is necessary to realise the interests of farmers, including those with the character of general (social and economic) embeddedness.

It is advisable to continue research on the determinants of the positive effects of embedding relations in agricultural sectors, taking into account relational features or network structure. Another important direction of research is the creation of the concept of embedding, in which financial and scientific organizations will be taken into account, to support the economic development of farms meeting the sustainable objectives of agricultural policy.

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OCENA RELACJI OSADZENIOWYCH GOSPODARSTW Z ORGANIZACJAMI BRANŻOWYMI

Słowa kluczowe: relacje osadzeniowe, osadzenie branżowe i geograficzne, organizacje branżowe, rasy zachowawcze

ABSTRAKT

Celem badań była ocena relacji gospodarstw z organizacjami branżowymi w ujęciu zjawiska osadzenia (branżowego i geograficznego). Występowanie cech osadzeniowych relacji rozpatrywano w kontekście uzyskiwanych cech ekonomicznych gospodarstw takich jak (sprzedaż, koszty bezpośrednie, odsetek kontraktacji). Badania z wykorzystaniem kwestionariusza wywiadu przeprowadzono w celowo dobranych 145 gospodarstwach, utrzymujących zwierzęta hodowlane ras zachowawczych z Polski południowo-wschodniej i we współpracujących organizacjach branżowych. Ocenę jakości relacji, które kształtują osadzenia wykonano za pomocą regresji wielorakiej krokowej w grupach według branż i położenia geograficznego. Wyniki analiz wskazują na możliwość wzrostu efektywności ekonomicznej gospodarstw z trzodą chlewną. Najistotniejszą cechą osadzenia branżowego, oddziałującą na zwiększanie kontraktacji sprzedaży, była moc zależności w relacji (im większa zależność w relacjach, tym większa kontraktacja sprzedaży). W analizach relacji reprezentujących osadzenie geograficzne, najistotniejszy pozytywny wpływ miała wysoka ocena cechy „jakość komunikacji", której obecność wpływała na obniżanie kosztów bezpośrednich gospodarstw. Relacje gospodarstw z organizacjami branżowymi mogą być osadzane branżowo i geograficznie, a efekty z „ukorzeniania" powinno być zawsze poddawane krytycznej analizie, a nie traktowane jako unikalna, wyróżniająca się cecha.

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