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Abstract: This study examines the extent of farmers' potato supply to local school canteens in the Czech Republic and the farm characteristics associated with such collaboration. Guided by structuration theory, a questionnaire was developed and distributed to all potato growers nationwide to explore supplied volumes, potential dynamics of supply in response to policy supports, and the structural and managerial traits of farms most inclined to engage in this arrangement. Descriptive statistics summarized the collected data, while analytical statistical methods were subsequently applied to examine the relationships among variables. Quantitative results were contextualized using farmers' qualitative comments. Results show that one-third of farmers supply local schools, but supplies account for only 5% of their production. The proposed measures show the potential for a substantial increase in the volume supplied and number of farms involved. Both structural and managerial elements associated with the propensity to supply were revealed. By quantifying volumes and production shares from the farmers' perspective, the study addresses a gap in research that has largely focused on qualitative aspects of collaboration. Insight into quantitative aspects, complemented by structural and behavioural farm characteristics, helps local governments understand the strength of local supply chains and the extent of collaboration between agricultural producers and public institutions like schools, and to design infrastructure developments and broader regional initiatives more effectively.

Keywords: farm-to-school, local food chains, potato growers, volume quantification, farm characteristics, Czech Republic

Souhrn: Studie zkoumá rozsah dodávek brambor od zemědělců do místních školních jídelen v České republice a charakteristiky zemědělských podniků spojené s touto spoluprací. Na základě strukturální teorie jako teoretického rámce byl vypracován dotazník, který byl distribuován všem pěstitelům brambor v celé zemi s cílem zjistit aktuální objemy dodávek, potenciální dynamiku dodávek v reakci na podpůrná politická opatření, jakož i strukturální a manažerské charakteristiky zemědělských podniků, které mají sklon se do spolupráce zapojit. Získané údaje byly shrnuty pomocí deskriptivní statistiky a k tomu byly prověřeny asociace mezi proměnnými pomocí analytických statistických metod. Kvantitativní výsledky byly doplněny o kontextuální hledisko na základě komentářů farmářů. Výsledky ukazují, že třetina zemědělců dodává produkty místním školám, ale tyto dodávky představují pouze 5% jejich produkce. Navrhovaná opatření ukazují potenciál pro podstatné zvýšení objemu dodávek. Byly odhaleny jak strukturální, tak manažerské prvky související se sklonem k dodávkám. Kvantifikací objemů a podílů na produkci z pohledu zemědělců studie řeší mezeru ve výzkumu, který se převážně zaměřuje na kvalitativní aspekty určující spolupráci. Náhled do kvantitativních aspektů doplněný o strukturální a behaviorální charakteristiky zemědělských podniků pomůže místním samosprávám pochopit sílu místních dodavatelských řetězců, rozsah spolupráce mezi zemědělskými producenty a veřejnými institucemi, jako jsou školy, a efektivněji navrhovat rozvoj infrastruktury a širší regionální iniciativy.

Klíčová slova: z farmy do škol, místní potravinové řetězce, pěstitelé brambor, kvantifikace množství, charakteristika zemědělských podniků

Highlights

- The Czech school meals tradition represents a significant possible demand for local food.
- Unique quantification of supplied volumes and potential of their dynamics is shown.
- Structural farm elements are the premise for supply, but active responses of agents are crucial.
- Findings are based on data from growers across all regions and farm sizes in the country.

- Results enable local authorities to target regional policy for specific development challenges.
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1. Introduction

Collaboration within local communities deepens people's connection to the places they live and fosters a shared sense of belonging and responsibility. Local collaboration can be applied across a wide range of human activities, including environmental protection, social services, education, cultural initiatives, and beyond. It also plays an important role in the local economy. By prioritizing local suppliers, communities help keep financial resources circulating within the region, creating a multiplier effect for the rural community (Schmit and Liu, 2025).; stronger demand for local products helps stabilize small and medium-sized enterprises, making them less vulnerable to external market fluctuations (Michel-Villarreal *et al.*, 2021; Tumuramye *et al.*, 2025). In addition, closer relationships build trust and foster long-term partnerships that contribute to sustainable economic growth and greater regional economic resilience (Schauppenlehner-Kloyber, 2017; Cruz *et al.*, 2021).

Collaboration between farmers and local school canteens represents an important mechanism for rural development and local communities. Local sales shorten supply chains, which helps reduce transport emissions and ensures fresher food (Galloway and Devine, 2022). Connecting schools and farmers also builds up the relationship between children, their parents and the place they call home, and increases their awareness of where food comes from (Leake *et al.*, 2025; Wen and Connolly, 2022). This creates a link among education, the local economy, and environmental protection, supporting the region's long-term sustainable development. These local benefits align closely with broader European objectives: by promoting sustainable food production, reducing carbon emissions, and supporting rural economies, such initiatives contribute to the goals of the European Green Deal (European Commission, 2019) and the Farm to Fork strategy (European Commission, 2020), which aim to make Europe climate-neutral by 2050.

Nevertheless, numerous studies show that the implementation of farm-to-school programs is not without its challenges. Before all, there is no single definition of what constitutes a local product (Galloway *et al.*, 2023). Moreover, the cost and logistic difficulties have been discussed (Roche and Kolodinsky, 2011), as well as the lack of infrastructure and staff challenges (Watson *et al.*, 2013), among other issues, such as the availability of facilities and skilled labour for farm products processing at schools (Janssen, 2014). Procurement rules and administrative burdens were of interest, with procurement schemes often limiting the inclusion of local supplies in selection criteria (Šūmane *et al.*, 2021). The supply side, including farmers' interest in collaborating, available volumes, and seasonality, also received attention and intervention. Dyg *et al.* (2015) found that matching supply and demand, coordinating schedules, and aligning farmer and school expectations are recurrent problems. Janssen (2014) ranks among the big issues the reliability of local farmers' supply capacity and mismatched expectations between farmers and schools, which can result in supply disruptions. Soares *et al.* (2017) and Pinard *et al.* (2013) highlighted low production capacity and supply volatility as barriers. On the other hand, previous findings (Izumi *et al.*, 2010) indicate that many farmers have been able to cope with these challenges. Despite the well-documented obstacles faced by direct-to-consumer producers, there remains a limited understanding of the characteristics of producers who have successfully sold directly to institutions.

This study is framed as a national case study of the Czech Republic, which provides a relevant setting due to its specific institutional framework and ongoing policy emphasis on short supply chains and local sourcing. The Czech Republic is characterized by a long-standing tradition of school meals and by extensive coverage nationwide. Practically all pupils have access to a warm lunch at school, so that in a country of ten million inhabitants, more than 1.6 million meals are served in school canteens every school day (MEYS, 2025a). These features indicate that the Czech Republic may offer useful insights for countries aiming to develop school meal programs. The mandatory components of the school lunch basket, set by the Czech Ministry of Education, Youth and Sports, are meat, dairy products, fruit, vegetables, potatoes, legumes, fats and sugars (MEYS, 2025b). The share of potatoes in the prescribed structure for age groups from 4 to 18 years is 21% by weight, amounting to 102 g per school day and pupil on average, which represents

the annual school consumption of about 30 thousand tonnes. Such school consumption of potato represent huge potential for local sales.

To strengthen sustainable food production and support rural areas, the Czech government institutions have proposed increasing the purchase of food for school canteens from local sources. While the inclusion of organic food in school meals has already been mandated in the Czech Republic (MEYS, 2005), no mechanisms exist to support procurement from local farmers, nor is there any evidence documenting such purchasing practices. Consequently, uncertainty remains about farmers' willingness to collaborate with local school canteens and the overall potential for local product supply. Are supplies to local schools attractive to farmers? Does the intention to supply schools with locally sourced food have a perspective, and can policy measures in this direction support rural development?

The aim of this study was to assess farmers' engagement in local relationships by examining their willingness to collaborate with local schools, estimating the potential dynamics of collaboration in response to policy measures, and identifying the farm-level features that shape such collaboration. To achieve this objective, three research questions were formulated: i) What share of potato growers in the Czech Republic collaborate with school canteens and what quantity do they supply? ii) Would the introduction of facilitating policy measures influence the local supply dynamics and increase potato growers' interest in supplying local schools? iii) Which types of farms are most predisposed to engage in such collaboration?

Our cross-sectional study integrates both quantitative data on current and potential production volumes supplied to schools and qualitative comments on farmers' attitudes on a national scale, reflecting farm sizes from the smallest to the very large and a range of growing conditions. Based on our review, we did not identify any quantitative data on the volumes of local foods supplied to school catering published so far, nor any models of their temporal dynamics; should such data exist, they appear to lie outside the mainstream published record, which further accentuates the uniqueness and scholarly value of studies that provide this quantification. Knowledge of current supply volumes, untapped potential, and farm characteristics provides a basis for effectively setting regional and municipal policies. It enables municipalities and regions to assess the robustness of local supply chains, the degree of interconnection between farmers and public institutions (schools), and to better plan the development of infrastructure and other elements of regional growth.

2. Theoretical framework

Over the past several decades, there have been growing calls to reshape market dynamics in favour of farmers (Ikerd, 2011), accompanied by the development of alternative forms of cooperation within local food systems (Berti and Mulligan, 2016). A local food system represents a self-governing assemblage of public and private actors collaborating to manage food-related activities within a defined territory (Stoker, 1998).

Such a kind of local or regional networking often generates issues related to individual approaches within the system, but challenges also often surface when it connects with other systems (Asheim and Isaksen, 2002). Local food delivery systems relying on short supply chains are typically analysed through supply chain management, sustainability frameworks, concepts of social embeddedness and value-creation approaches (Corvo *et al.*, 2024; Paredes *et al.*, 2024). In contrast, structuration theory (Giddens, 1983), an effective framework for addressing the intertwined relationship between individual choices and the broader structural forces of the food system, remains largely underused in this field. At the heart of structuration theory lies the idea of the duality of structure: individuals act within structures that guide their behaviour, yet their actions also reproduce or transform those very structures. This approach, which posits that structure and agents are separate but also co-constitutive forces (Walmsley and Lewis, 1993), reflects a critique of structuralist frameworks which overlook the role of individual choice.

In the context of farm-to-institution initiatives, such as farm-to-school deliveries, scholars highlight several structural elements that shape these arrangements. Taken together, these elements do not merely support local food systems but actively constitute them, as their interactions form the organizational,

institutional, and relational basis for linking local production and consumption. Besides primary producers and customers, such systems typically include the meso environment consisting of territorially embedded networks of actors, institutions, governance structures, and mechanisms that coordinate production, distribution, and consumption at the local and regional level and enable local collaboration (Renting *et al.*, 2003; Marsden *et al.*, 2000). These encompass organizational structures, such as producer organizations, food hubs, and distribution networks (Anggraeni *et al.*, 2022), as well as intermediaries (Gaitán-Cremaschi *et al.*, 2024), and support systems, such as knowledge and innovation actors, local action groups, NGOs, and others. Moreover, the meso environment should also involve market mechanisms (Wen and Connolly, 2022) and benefit from social networks based on informal partnerships and trust (Stoeva *et al.*, 2024). An important role is also played by policy supports and legal or regulatory frameworks (Harris *et al.*, 2012; Izumi *et al.*, 2010).

All of these elements can be understood as human-constructed and dynamic institutional features. At the same time, the broader regional context may be shaped by environmental characteristics – such as soil quality or climate – which are relatively resistant to human influence but may predispose the region to particular forms of agricultural specialisation (Stoicesa *et al.*, 2025). Such an environmental context also relates to the organization of the regional food system, including the availability of supporting infrastructure and prevailing market conditions. As a result, actors may be embedded within specific social structures shaped by local traditions, shared knowledge, and longstanding social ties (Goffart *et al.*, 2022).

3. Data and Methods

Based on the structuration theory, we drew on previous findings from scholars and our pilot discussions with representatives of professional associations and selected farmers to compile a questionnaire for farmers. Primary data were obtained from farmers growing potatoes under a conventional regime in the Czech Republic. Basic information on these companies was acquired from the database of applicants for voluntary coupled support (VCS), which essentially includes all potato farms in the country. This support is provided under the EU Common Agricultural Policy (CAP) due to the threatened status of potato growing in the Czech Republic. The contact information from this database of applicants was incomplete, so it was necessary to search for their email addresses directly on the websites of those companies. Once the email addresses were obtained, 944 companies were contacted and asked to complete an electronic questionnaire. Primary data collection took place in March and April 2025.

The electronic questionnaire was created on the Survio platform², which enables the distribution of marketing research or surveys and allows researchers to include various question types. Before the questionnaire was distributed, a pre-test was conducted to verify the comprehensibility of the questions for respondents and the sequence of questions. To enhance the interpretation of the questionnaire survey results, the farmers were invited to write their own comments on the questionnaires. Responses to these open-ended questions were analyzed using thematic analysis. Meaning units were first identified, and responses were subsequently grouped into categories emerging directly from the data. These categories were then consolidated into broader themes. The resulting themes complemented and interpreted the quantitative findings, providing deeper insight into the observed trends and relationships. The analysis was conducted manually using a spreadsheet.

The questionnaire focused on farm size features, its location, whether and which volume farmers currently supply potatoes to local schools, and whether they would begin supplying or increase the volume supplied if facilitating measures, as defined by us, were introduced. Farmers also reported on their current sales channels, the seasonality of their sales, their level of satisfaction with sales performance, and their interest in participating in an organized meeting with schools and other growers. Their opinions on the last two points (satisfaction and willingness to meet) were expressed using a five-point Likert scale. Facilitating measures were offered as follows: provision of information on school contacts and demand, support of transport organization, administrative assistance, and farm promotion.

² Survio is a Czech service for the creation and distribution of online questionnaires. The company has been operating since 2008 and provides its services in 17 world languages on the principle of software as a service.

Farmers responded to each measure; if at least one elicited a positive response, the farm was classified as a positive responder willing to develop the cooperation, and the declared increase in supply volume was recorded. Additional data on potato production volumes in particular administrative regions of the country, used to calculate production density, were obtained from the Czech Statistical Office survey (CZSO, 2025).

From the structuration theory perspective, some questions address typical structural features of the main actors, such as farm size, as well as sales seasonality reflecting the availability of storage facilities. Questions on the utilisation of specific sales channels capture the interaction between structural and behavioural dimensions, reflecting both their availability and use. Farmers' willingness to participate in meetings with school representatives as a sales-facilitating activity primarily reflects behavioural aspects but is inherently linked to the presence of these structural mechanisms. The information on whether farms are located in typical potato-growing regions builds on the possibility of specific local arrangements. Based on these characteristics, we examine which types of farms are most likely to collaborate with schools.

As there is no single definition of the term 'local' (Enthoven *et al.*, 2021), we had to define it in the questionnaire so that all growers understood it consistently. Having in mind a range of constructions using features such as sustainability, social and community systems (Dunne *et al.*, 2011), certification standards (Gil and Soler, 2006), political units (Rose, 2013) and others, we came out, for its understandability, from the frequently used geographical proximity criterion (Kneafsey *et al.*, 2013). The study of Blake *et al.* (2010) showed that „local“ is a recognizable concept only when it relates to a small area. Based on consultation with the farmers' market association and their experience with vendor travel distances at regional markets across the country, we set the distance to which the questions applied at 50 km. This is in accordance with a 20–100 km geographical area understood by the EU Joint Research Centre for local food systems (Kneafsey *et al.*, 2013).

The research design follows a case study approach, with the Czech Republic serving as the empirical case. Descriptive statistics were employed to summarize and characterize the primary data. Analytical statistical methods were subsequently applied to examine the relationships among variables. The nonparametric Mann–Whitney U test was used to assess the significance of the association between farm area and whether farms supply schools or would be willing to supply or increase supplies if facilitating measures were implemented. The same approach was applied to examine the relationship between potato acreage and school supply. The effect size was calculated as the absolute value of the standardized Z test divided by the square root of the total sample size. Associations between nominal variables were examined using the Chi-square test of independence. The strength of association in 2×2 contingency tables was quantified using the Phi coefficient. Relationships between continuous variables were assessed using Spearman's correlation test, with the rho coefficient indicating the magnitude and direction of the association. Statistical significance was evaluated using p-values, and the null hypothesis of no association was rejected when the calculated p-value was lower than the predetermined significance level ($\alpha = 0.05$). All statistical analyses were conducted using IBM SPSS software.

4. Results

4.1 The extent of the sample and farm size

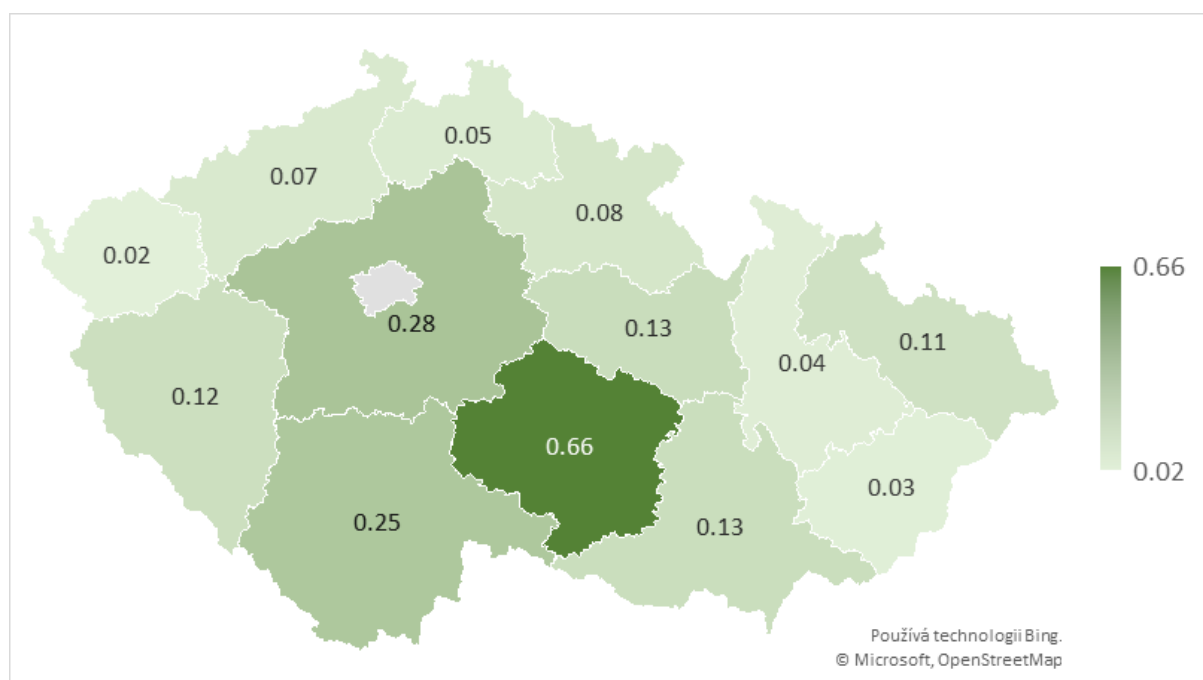
The sample of respondents ($n = 164$ farms) represents a response rate of 17.4%, which also approximates the proportion of responding growers among the total number of growers in the country. These farms manage 47.8 thousand hectares of agricultural land, including 2.8 thousand hectares devoted to potatoes, representing 13% of the national potato-growing area.

The study includes farms of all size categories. Under the Eurostat classification (Eurostat, 2024), about one third of responding farms are very small and small (up to 20 ha), another third are medium-sized (20–100 ha), and the remainder are large and very large farms (over 100 ha), with very large farms accounting for 16.5%.

Farm size ranges from about 1 to 4,100 ha (median 44.5 ha; mean 291 ha), 6.1% of which exceed 1,500 ha. Potato area per farm ranges from 1 to 218 ha (median 3 ha; third quartile 9 ha), with a mean of 17 ha, indicating that most farms grow potatoes on small areas while a few large producers skew the average upwards; 6.1% cultivate more than 100 ha of potatoes.

In thirteen country administrative districts (excluding the capital city of Prague), the density of potato production varies considerably (Figure 1). For the purpose of the study, three types of potato-growing regions were distinguished based on production density: the main potato-growing region (Vysočina), a single administrative district with an average production density of 0.66 t/ha of arable land; ten potato non-growing districts with much lower densities (0.02–0.13 t/ha); and two mixed districts with intermediate densities of 0.25–0.28 t/ha.

Fig 1. The density of potato production in administrative regions in Czechia (t/ha arable land). Source: own calculations based on data of the Czech statistical office (CZSO, 2025)



4.2 Farms' attributes and management approaches

Selected farm characteristics were analyzed to assess their potential influence on collaboration with school canteens. Table 1 classifies farms by whether they currently supply potatoes directly to schools and, within each group, by their willingness to expand or start supplying under specified facilitating measures.

Rows 1–7 describe mainly structural characteristics, rows 8–13 combine structural and behavioral aspects related to the use of particular sales channels, and additional questions (rows 14–17) capture farmers' attitudes toward changes in sales behavior. Statistical analysis methods, specifically the association testing, were used to assess the significance of relationships between variables. The resulting p- values of the relevant statistical tests are shown in Table 2.

Over one third of farms already supply school canteens. Supplying farms have larger potato areas than non-supplying ones (table 1, row 3), and the Mann-Whitney test confirms this difference is small but significant (table 2, row 2A), while farm area shows no significant effect. The median potato area for supplying farms is 5 ha (third quartile 16 ha) versus 3 ha (9 ha) for the full sample.

Tab 1. Farms' structural and management characteristics; the average values. Source: own investigation

				Supplying schools			Not supplying schools			
				All	Willing to increase	Unwilling to increase	All	Willing to Start	Unwilling to Start	
Size, location, storing	1	Farms number	n	164	61	50	11	103	76	27
	2	Average farm area	ha	291	333.0	224.3	826.1	267.0	308.9	147.8
	3	Average potato area	ha	17.1	21.0	17.7	35.8	14.9	14.6	15.7
	4	Farms in the potato-growing region	n	35	13	12	1	22	15	7
	5	Farms in a mixed region	n	44	17	16	1	27	19	8
	6	Farms in the potato non-growing region	n	85	31	22	9	54	36	18
	7	No. of months offering potato ¹⁾	n	8.4	10.2	10.7	7.7	7.4	8.1	5.5
Sale channels	8	Selling to producers' organisation	n	23	11	7	4	12	11	1
	9	Not selling to producers' organisation	n	141	50	43	7	91	65	26
	10	Selling to Horeca ²⁾	n	52	35	30	5	17	15	2
	11	Not selling to Horeca	n	112	26	20	6	86	61	25
	12	Selling from the farm gate	n	150	56	46	10	94	70	24
	13	Not selling from the farm gate	n	14	5	4	1	9	6	3
Sale attitudes ³⁾	14	Satisfied with their sales	n	103	44	37	7	59	39	20
	15	Not satisfied with their sales	n	40	11	8	3	29	25	4
	16	Want to meet with schools	n	102	42	36	6	60	50	10
	17	Do not want to meet with schools	n	37	13	11	2	24	13	11

Note: ¹⁾ The average months when offering potatoes could be associated with ownership of storage facilities at the grower's premises. ²⁾ Horeca is the acronym referring to the hotels, restaurants and catering sector. ³⁾ Questions assessing satisfaction with sales and willingness to meet included not only positive and negative options but also a neutral category, however, rows 14 to 17 display only the positive and negative responses.

Willingness to expand deliveries is not significantly linked to the farm or the size of the potato area. Farms that do not wish to expand or start supplies are either substantially larger (826.1 ha) or apparently smaller (147.8 ha) on average than farms with an interest in supplies progress. In pilot discussions, representatives of very large farms with processing facilities said supplying small quantities to schools is „a waste of time“ that reduces profits due to the administration and logistics of small quantities. In contrast, mid-sized and small farms (<200 ha) noted schools' lack of interest and requested peeled potatoes, which they cannot provide. Thus, very large farms see sale to schools as unprofitable, while small farms may be unsuitable for schools lacking peeling equipment.

Farms collaborating with schools reported longer annual potato availability (10.2 months) than non-collaborating farms (7.4 months; Table 1, row 7), likely due to storage capacity and flexible sales. The relationship between deliveries and months with sales was tested: first for annual sales, then the number of months was gradually reduced. The chi-square test revealed a clear pattern: farms that sell year-round are more likely to supply schools and expand deliveries (Table 2, row 7), whereas those that sell ≤5 months are reluctant to deliver or increase school deliveries (Table 2, row 8).

Location in a specific region does not affect supply to schools but slightly influences willingness to expand deliveries; the Chi-square test shows a slightly higher willingness in mixed regions, while a bit elevated reluctance in potato non-growing regions (Table 2, rows 5–6). Farmers' comments revealed that those in the potato-growing region face strong demand, with production often contracted before sowing and customers reserving entire fields. They take pride in high-quality potatoes, mainly sold directly to end consumers, who appreciate quality and pay more. Establishing fixed sales relationships between local

farmers and schools could reduce the need for farmers in the potato-growing region to seek additional marketing channels, which often involve uncertain demand and challenging start-up conditions. In potato non-growing regions, low production and self-harvesting are more often cited as reasons against supplying schools, though farmers still stress quality, which, however, schools appear to be less aware of.

Behavioural factors were examined to see if experience with certain customer types relates to supplying or expanding deliveries to schools. Farmers were asked through which channels they sold their products; three of them were listed explicitly (tab 1, rows 8 to 13), and the option “other” was also provided. Overall, 58% used one channel only, 22% two, 16% three, and 4% four (all excluding schools). The average number of channels was 1.66 for farms supplying schools (excluding schools) and 1.42 for those that do not.

In total, 32% of farms collaborate directly with Horeca. Among them, over 67% also supply schools, most expressing interest in expanding or starting deliveries. Only 23% of non-collaborating farms supply schools; their willingness to expand is lower than by collaborating farms. The relationship between Horeca and school sales is statistically significant, large for current supplies and small for willingness to expand (Table 2, row 11A), unlike other channels, which show no association (Table 2, rows 9–10).

Tab 2. Associations between farms' characteristics and their potato supplies to school canteens. Source: own investigation

#		A		B	
		Supplying (yes/not)		Willing to start/increase (yes/not)	
		r	p-value	r	p-value
1	Farm area	0.078	0.159	0.018	0.751
2	Potato area	0.127	*0.022	0.022	0.696
3		phi	p-value	phi	p-value
4	Growing region ¹⁾	-0.001	0.990	-0.031	0.688
5	Mixed regions ²⁾	0.018	0.817	0.228	**0.003
6	Non-growing regions ³⁾	-0.016	0.842	-0.182	*0.020
7	Potato offering whole year	0.322	***< 0,001	0.216	**0.006
8	Potato offering up to 5 months ⁴⁾	-0.282	***< 0.001	-0.273	***< 0.001
9	Selling to producers' organisation	0.089	0.255	0.031	0.861
10	Selling from farm gate	0.039	0.617	0.009	0.905
11	Selling to Horeca	0.425	***< 0.001	0.157	*0.045
12	Satisfied with their sales	0.148	0.057	-0.094	0.230
13	Want meeting with schools	0.106	0.176	0.228	**0.004
14		Volume delivered		Volume willing to start/increase	
15		rho	p-value	rho	p-value
16	Farm area	0.168	0.196	0.126	0.161
17	Potato area	0.318	*0.012	0.501	***< 0,001

¹⁾ Growing region in the case of the Czech Republic comprises one administrative region (Vysocina). ²⁾ Mixed region covers the district Jihocesky and Stredocesky. ³⁾ Non-growing region comprises the remaining ten regions. ⁴⁾ The threshold of ≤ 5 months is based on the exploratory analysis made by reducing the whole year period gradually, month by month, until the value shows the boundary.

Interestingly, farmers supplying both schools and Horeca, thus having experience in two direct-sales channels, reported more comments on school deliveries than the average. These respondents are likely comparing the two channels, which may make school deliveries appear to them as a more challenging collaboration. They often highlight challenges, such as strong competition from wholesalers or other suppliers noting that “each canteen already has a potato supplier, and it's hard to get there somehow”, but also note positive experiences, like schools approaching them directly e.g., “in our village, the school itself approached me to supply potatoes and it has been working to mutual satisfaction for several years”.

This suggests that even in a competitive environment, successful cooperation is possible when both sides are willing.

About two-thirds of farmers are interested in meetings with schools (Table 1, row 16), most of whom (85%) are willing to start or expand supplies; the chi-square test shows that the association between willingness to supply and meeting participation is moderate and significant. Regarding overall satisfaction with sales and supplies to schools, no correlation was found.

4.3 Volumes supplied

Current suppliers (61 farms) reported delivering 997 t annually, about 4.8% of their production. In contrast, 126 farms willing to start or expand deliveries estimated an additional 5,352 t, or 9.8% of their production. Non-suppliers showed willingness to supply a greater share of their production (10.9%) than current suppliers to increase volumes (8.5%), indicating higher motivation among farms without prior school-delivery experience.

As reported volumes varied widely, data were visualized by potato area (Figure 2). The visualization shows that while current supplies from farms with small potato areas – and indeed from farms with larger areas – are low in volume (left side of Figure 2), the planned increase or start of supplies from farms with small areas is reported to be significantly higher in volume; and at the same time, several farms with large fields have also declared their willingness to deliver large quantities of produce (right side of Figure 2). The indicated more than fivefold increase, therefore, reflects not only the planned involvement of farms with large potato areas, but also the reported increase in supply from farms with small potato fields. This trend indicates significant and promising supply potential. In general, Spearman's test shows that farms with larger potato acreage deliver more potatoes (Table 2, row 17A) and are inclined to start or expand by bigger volumes (Table 2, row 17 B); moreover, the association related to the willingness to expand (start or increase) proved to be large and the strongest ($\rho = 0.501$) of all significant associations. Overall farm area, however, has no effect on delivered volume.

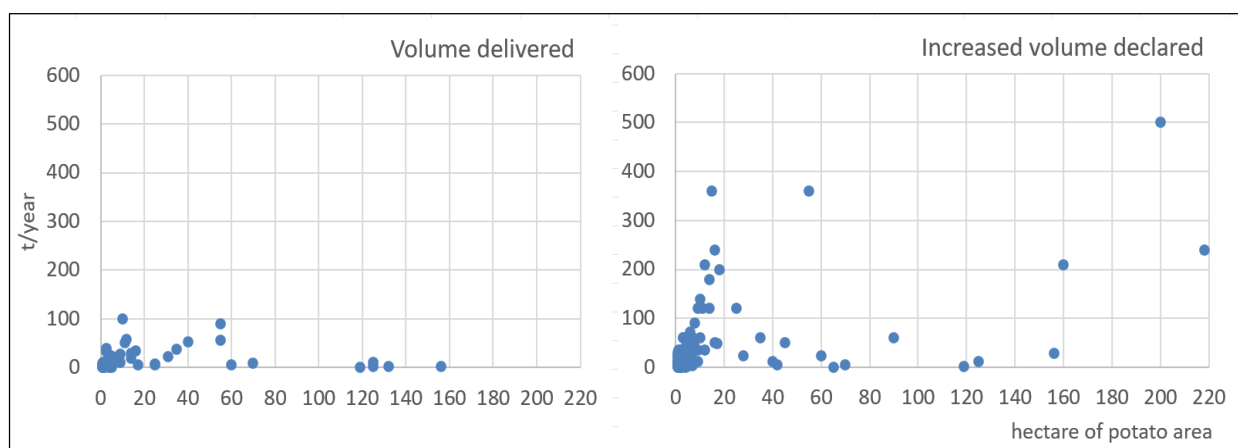


Fig 2. Volume of potatoes supplied to schools and the increase declared by the potato area. Source: own investigation

The comments show that farmers willing to increase supplies often have long-term relationships with school canteens but express concerns about rising demand for processed potatoes and price levels. Those interested in starting deliveries stress the need for stable partnerships to overcome barriers such as logistics and processing. In contrast, unwilling farmers argue that school canteens' requirement for processed potatoes, their reluctance to change suppliers and accept a limited purchasing range, as well as their preference for wholesalers.

4.4 Farmers comments

From a structuration theory perspective, farmers' comments can be grouped into those reflecting structural conditions of the value chain and those related rather to agents' behaviour within these conditions. Within the structural group, processing, wholesale, and on-farm storage emerge as key issues. Farmers report that peeling machines, once standard in school kitchens, are increasingly disappearing, particularly after kitchen renovations. Processing companies – and especially wholesalers – enable school kitchens to operate without in-house processing equipment or staff. While some farmers view investing in peeling machines as financially unfeasible, others point to the excessive bureaucracy involved. Nevertheless, partial adaptation is evident: of the 61 farms supplying schools, nearly 10% already offer peeled or further processed potatoes. Beyond processed products, wholesalers are also perceived as strong competitors due to their broad assortments and low price level. Storage is another decisive factor: 72% of school-supplying farms sell potatoes year-round, whereas farms that sell for no more than 5 months account for only 13% of school suppliers. This highlights a strong skew toward year-round availability, compared with the full sample, where only 50% sell year-round and 30% sell for up to five months.

Comments reflecting agents' behaviour focus mainly on the stability of business relationships, recognition of production quality, and ties to the locality. Farmers often express concern about the unreliability of school demand, noting that schools tend to favour short-term wholesale offers at lower prices, where even small price differences are decisive, rather than committing to long-term partnerships. The perceived value of short supply chains by farmers extends beyond economics; farmers associate participation with aspects of reputation, personal responsibility, and relationships with consumers. This is summed up by one farmer's statement: "Every potato producer sells not only the product but also his name and quality, taking responsibility for the goods he sells". While some farmers report that schools do not appreciate the quality of fresh potatoes and do not feel the need to support the region, others confirm good long-term cooperation and schools' interest in local supplies.

5. Discussion

Farmers cited a number of problems that discourage them from supplying schools, among them being the increasing demand for basic processing, competition from the wholesale, the inability to store potatoes for long periods, logistics costs, the preference for other forms of sales (large-capacity sales, farm sales, self-harvesting), as well as concerns about uncertain demand. This is consistent with previous findings such as the lack of pre-processing infrastructure and wholesale dominance, including price advantages, mentioned by Braun *et al.* (2018) for Germany, Heron and Oglethorpe (2009) for England, financial pressures highlighted by Walker and Brammer (2009) for the United Kingdom, seasonal coordination of supplies at Dyg *et al.* (2015) for Denmark, the organization and logistic costs at Janssen (2014) for the US Midwest, Roche and Kolodinsky (2011) for US Vermont. This shows that problems are clearly not regional in nature, as evidenced by the comparison of potato-growing and potato-non-growing regions within the Czech Republic. It can therefore be assumed that farms supplying schools have also encountered these problems and found some solution. The 997 tonnes supplied by respondents (almost one-fifth of national growers) account for roughly 2% of potato consumption in school canteens; the declared fivefold increase would raise this to about 10%. Extrapolating the sample nationwide, current supplies would cover around 12% of school consumption, while the increased supply could meet nearly two-thirds of total demand. Despite the sample covering just under one-fifth of all growers, and even though the declared increase in production, as well as its theoretical extrapolation, should be interpreted with caution, the figures nevertheless point to substantial supply potential.

According to our results, the most important characteristics of supplying farms are collaboration with the Horeca sector, and the probability also increases with larger potato acreage. It indicates that sales in the Horeca sector and in school canteens share certain features. According to Oleksiuk *et al.* (2023), the supply of agricultural products to both the Horeca sector and public catering follows the same logic: short food supply chains that rely on close collaboration with local producers, short distribution routes, and a clear focus on quality, freshness, and traceability. Paciarotti *et al.* (2022) highlight the importance

of reliable delivery and sustainable, long-term cooperation between producers and restaurant operators, both of which must be supported by mutual trust and effective communication. This is consistent with farmers' comments in our research, which emphasize long-term relationships and the ability to respond flexibly to changing customer requirements as prerequisites for cooperation. Sharma *et al.* (2012) conclude that farmers who already collaborate successfully with the Horeca sector often demonstrate more advanced organizational and logistical capabilities, which enable them to expand their operations into institutional catering, including schools and hospitals. From this, it can be inferred that supplying and non-supplying farmers usually operate in comparable environments, but overcoming the former's obstacles is, among other factors, based on personal characteristics such as the will to overcome difficulties, organizational skills, and communication skills. This approach can be illustrated by several examples of good practice in the Czech Republic that demonstrate farmers' involvement in school food supply chains. In the initiative of The truly healthy school (Skutečně zdravá škola, 2022) established to support healthy school catering, as well as the digital platform South Bohemian digital marketplace in the South Bohemian Region, dozens of farmers, including potato growers, participate to become a part of the local food system and be linked to local schools (CzechInvest, 2024).

It is worth considering why farmers want to overcome obstacles and supply schools. Although farm-to-school supplies have been widely understood as a market opportunity for farmers, studies have shown that the income generated by school food sales has had little to no impact on farmers' incomes (Feenstra and Ohmart, 2012), which is also evident in our research, where the volume does not extent 5% of production on average. In addition, deliveries tend to generate additional costs rather than attractive prices. In the context of willingness to overcome obstacles, it is also interesting to compare current supply levels with the declared increase that would occur if "someone" had arranged the defined facilitating measures. The stated fivefold increase can be explained by the fact that farmers are willing to make the volume available but unwilling to resolve the logistical and organizational problems themselves. It is worth noting that, due to marginal use on the farm side, the previous government's support for collaboration within short food supply chains (SFSC) (MoA, 2014) has not been implemented since 2023. Most likely, the support conditions were strict or did not meet the farmers' objectives. In this context, actors operating at the local meso-level can play a significant role, as demonstrated by practical examples. Local Action Groups (LAGs), such as LAG Blaník (MAS Blaník, 2022) and LAG Brána Vysočiny (MAS Brána Vysočiny, 2023), facilitate linkages between producers, consumers and other market actors through concrete activities, including the organisation of thematic working groups on short food supply chains, stakeholder networking, and the development of digital tools such as regional producer maps that directly connect farmers with customers. Similarly, the Truly healthy school NGO (Skutečně zdravá škola, 2022) facilitates communication among local actors by providing an online platform with a map of local suppliers and schools interested in participating in local food systems.

In general, while barriers are often studied, little has been published on farmers' positive motivations, particularly their willingness to overcome difficulties to supply schools. Some scholars have used the concept of "embeddedness," arguing that markets have always been embedded in the social and cultural structure of our societies (Sonnino and Marsden, 2006). In contrast, Hinrichs (2000) argues with the concept of high and low marketability; exchange can be governed by market principles, where transactions are impersonal, price-oriented with little or no lasting relationship between buyer and seller (called as high marketability), or transactions can be embedded in social relationships, where long-term relationships, local context, and non-economic motives such as community and ethics play a role (defined as low marketability). On the other hand, rather than representing a shift in farmers' values and attitudes, SFSC may simply reflect farmers' need to spread their risks across many different markets. In summary, farmers' involvement in supplying schools can be driven by two main motivations: diversification of marketing strategies and the pursuit of social benefits through direct engagement. Similarly, our results show that farmers supplying schools tend to diversify their customer portfolio slightly more, with an average of 2.04 sales channels excluding schools, compared to 1.42 sales channels for those who do not supply schools. Hence, the successful collaboration with school canteens can be a combination of opening a new sales channel and perceptions of the social aspects of sales, such as a positive attitude towards the local community, attitudes towards children's health, and other character traits.

Regarding ties to the local environment, it is important to consider farmers' perspectives within the growing area. Previous research has shown that suitable climatic conditions foster regional specialization (Stoicea *et al.*, 2025) and specific market systems (Goffart *et al.*, 2022), a pattern also confirmed by our findings. Favourable conditions, reflected in high production density, obviously generate a strong tradition of cultivation, pride in product quality, and a greater tendency among farmers to sell directly to end consumers to maintain product identity and secure a higher price. Hence, although there was no significant tendency to supply schools in the potato-growing region, farmers' comments suggest they tend to favour short supply chains with other end customers. This may lessen the need to pursue alternative marketing channels, but farmers' stated orientation indicates the local dimensions of their market behaviour.

While current supplies account for approximately 5% of the production of supplying farmers, the identified facilitating measures show the potential for doubling the number of suppliers and a fivefold increase in volume without the need to expand production areas, suggesting that targeted interventions can have a significant multiplier effect for local communities. Hence, structural elements seem to have their place as a premise for supply (storage and likely processing facilities for the future), but their positive setting must be accompanied by positive behavior on the part of agents, which appears to be crucial.

6. Conclusions

This research examined the current scope and volume of potato supplies from farms directly to schools, as well as the potential for further development, using a combination of quantitative data and qualitative voluntary accompanying comments from farmers. Data were obtained from approximately one-sixth of growers nationwide, covering all regions and a wide range of farm sizes. While the findings are grounded in the specific institutional and market context of the Czech Republic, they offer valuable insights that may be transferable to similar settings where public procurement, local food systems, and institutional catering interact.

The study was structured around three research questions. Based on the resulting sample, the answer to the first research question is that in 2025, 37% of farmers supplied at least some potatoes directly to local schools; however, the volume supplied accounted for only 5% of their production. The findings related to the second research question indicates that if defined facilitating measures are introduced, farmers declare the potential for substantial growth in supply to schools. Specifically, the potential increase could be up to fivefold, driven by both a doubling in the number of farms willing to participate and a doubling of the share of production they intend to allocate to local schools. To answer the question of which types of farms are most susceptible to such collaboration, it can be summarized that primarily those farms are concerned with established cooperation with the Horeca sector, with storage facilities available, while the increasing growing area of supplied products (potato) strengthens both the probability and volume of supplies.

Based on the analysis, two-thirds of farmers are interested in engaging with schools. This orientation has the potential to contribute meaningfully to regional development and to enhance the socio-economic stability of rural areas. Nevertheless, their willingness to significantly increase supplies is conditional on external help ("someone else") to overcome delivery-related obstacles. This suggests that, beyond the relatively active farmers (who, as the findings suggest, often collaborate with catering companies), there is also a group of more passive or conservative farmers. A positive finding is that they are willing to meet with schools, likely expecting concrete outcomes.

This combination signals a clear opportunity for policymakers to capitalize on this willingness by providing well-designed and effectively targeted support. Here, the local meso-environmental system should play its role. Municipal and regional authorities, which not only provide municipal administration but are often also the founders of schools, could organise matchmaking meetings or regional platforms coordinated by these authorities or by local action groups, which can further facilitate structured communication between farmers and schools. Involving experienced suppliers and professional facilitators in such

meetings can help build trust and effective dialogue. Communication should address both practical solutions and motivational factors, such as sales diversification, social value, and regional identity.

The findings also indicate limited awareness of relevant contacts among local stakeholders. Public authorities could address this gap by providing farmers with accessible information on school contacts, along with estimates of demand based on pupil numbers and consumption data, which are typically available at the central level. This could be achieved by supporting digital marketplaces, encouraging participation in regional events, and raising awareness of the broader benefits of local food systems for public health, sustainability, employment, and rural development.

To address logistical challenges, regional and local authorities could support the development of shared delivery systems, promote access to digital optimization tools, or even initiate the establishment of super-local logistics centres. Reducing administrative burdens represents a relevant area of intervention. Coordinated back-office services, improved access to accounting and consultancy providers, and support for the digitalisation of ordering and procurement processes, as well as their simplification, may enhance cooperation within the local food supply chain. Support for farmers' participation in regional events may also help reinforce local food networks and producer–consumer relationships. The cited best-practice examples show that local communities at the meso-level can play an active role in shaping and strengthening local collaboration.

In addition to the measures outlined above, primarily focused on coordination and organizational improvements, investments in storage and basic processing capacity have also proven essential. Although farm-level investments do not guarantee that schools will be supplied, they help shorten supply chains and open access to additional markets, including schools. Hence, the more effective the organizational and coordination initiatives are, the greater the potential for storage and processing facilities to be utilized within farm-to-school supply systems. In general, partnerships are more likely to succeed when farmers know they have strong regional support.

For farm managers, proactive use of information and contacts is essential. When demand data and contacts are available, farmers should approach school canteens directly, align deliveries with the school year, and agree on realistic volumes. Involvement in the school meal system can be seen not only as a business opportunity, but also as a tool for building the farm's reputation with potential spillover benefits for other marketing channels. Over time, investment in storage and processing capacity becomes important, while contracts with external partners or shared facilities can serve as interim solutions.

The structural theory has proven to be functional. Entities with appropriate structural equipment have a clear advantage; storage and pre-processing play a significant role for farmers. At the same time, however, agents must actively respond to the given conditions, whether the motivations are strategic, social, or otherwise.

We do not pretend that this article is without limitations. While multiple factors may influence which businesses are most likely to supply schools, the scope of the analysis was constrained by the need to limit the number of survey questions in order to ensure an adequate response rate and data quality. Regarding the responses, it should be noted that farmers who are more active or hold stronger opinions may have been more likely to participate. Additionally, their answers reflect subjective perceptions, meaning both factors may be subject to reporting bias. Projected future volumes are hypothetical and should be interpreted with appropriate caution. Nevertheless, we believe the findings provide valuable insights into the dynamics of local collaboration, with a particular focus on farm-school partnerships.

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