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Expressing Added Value in Food Supply Chains

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ABSTRACT

Value-added food supply chains are chains that maintain positive social, environmental, and community values which are integrated into the production process from the primary producer to the final consumer, ensuring economic, social, and environmental sustainability, thus forming a sustainable agricultural and food production system. The evaluation of the value added in each chain is based on indicators, which are a tool to measure changes in the actual situation or to show performance trends in achieving the progress set by the objectives. The presented indicators are based on publicly available statistics and foreign literature that allow measuring value added in specific livestock chains at aggregate level (beef production, pork production and dairy production) and are based on publicly available statistics in the Republic of Slovenia. The need to produce indicators of value added in livestock food supply chains arises from the large differences in structural changes in the sector itself and in the development and economic performance of the various livestock industries.

Key words: food supply chain, value-added, indicators, sustainability, economic, social and environmental aspect

INTRODUCTION

In the scientific literature, there is no uniform definition of the term " value chain," which means that it varies from author to author in certain details. Value chains or quality food supply chains are characterised by maximising production value for individual actors in the chain, while consumers perceive agricultural products or food from such food supply chains as: high quality, produced based on environmentally friendly production systems, with a positive indirect and direct contribution to the local economy and the community as a whole (Viitaharju et al., 2005; Stevenson et al., 2011; Prišenk, 2015; Lev et al., 2015; Todorovic et al., 2018; Malak-Rawlikowska et al., 2019; Clark et al., 2021; Bayir et al., 2022; Reckinger, 2022). The primary producer or farmer, considered an important and equal strategic partner, is also involved in management and decision-making. Business relationships between actors in each chain must be fair and based on trust, which implies a steady and equal distribution of rights and responsibilities (Prišenk, 2015).

Value-added food supply chains, or quality supply chains, are those in which all stakeholders in each chain recognise and maintain a degree of stability and certainty, which affects the trust and satisfaction of all stakeholders along the chain, regardless of the length of each food supply chain or the number of stakeholders involved (Stevenson and Pirog, 2008; Stevenson et al., 2011; Pirog and Bregendahl, 2012; Kneafsey et al., 2013; Prišenk, 2015; Lev et.al., 2015; Feenstra and Hardesty, 2016; Ostrom, 2017; Todorovic et al., 2018; Vitterso et al., 2019; Peterson, 2022; Reckinger, 2022).

In defining the different aspects of added value or finding indicators of added value, we followed the characteristics of a sustainable food value chain developed by the FAO, which is:

- profitable at all its stages (economic sustainability)
- has broad benefits for society (social sustainability)
- positive or neutral impact on the natural environment (environmental sustainability).

Sustainable development proposes a balanced development that meets the needs of the present generation without compromising the needs of future generations, referring to the long-term balance between economic, social and environmental processes (Yakovleva, 2007). The concept of sustainable food value chains recognises that value chains are dynamic, market-led systems in which vertical coordination is the central dimension and for which added value and sustainability are explicit, multidimensional performance criteria assessed at aggregate level (FAO, 2014). A sustainable

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supply chain is characterized by managing environmental, social and economic impacts and working for good governance throughout the life cycle of products and services. The goal of a sustainable supply chain is to create, protect and increase long-term value for all stakeholders involved in the presence of products and services on the market (Yakovleva, 2007; Sisco et al., 2011; Malak-Rawlikowska et.al., 2019; Vitterso et al., 2019; Chiffoleau and Dourian, 2020).

The added value of chains is a broad concept that interferes with the different strands of sustainable development (economic, social and environmental). These three aspects of sustainability were also crucial in finding or formulating value-added indicators in food supply chains, which were divided into three groups into economic, social and environmental ones.

The need to create added value indicators in livestock food supply chains stems from significant differences in development and economic performance of the various livestock industrial sector. The Slovenian livestock food supply sector has been characterised in recent years by large differences between individual sectors relating to: the level of self- sufficiency of products, changes in the share of employees in each chain, payment inequality of employees by gender, low purchase prices of agricultural products, higher production costs, changes in external trade in products, share of farmed animals of native breeds, share of organically farmed animals.

The failure and inefficiency of connecting actors along the chains led to the decline of the successful development of supply chains with added value in Slovenia or to the creation of new ones. As a result, self-sufficiency in certain sectors fell, which brought with it many broader negative effects on agriculture and rural development (social, economic and environmental aspects).

The basic task of the research was to define the added value that is and will be expressed in food supply chains, typical of Slovenian agricultural production and animal husbandry. It should be emphasized that generalization of values compared to other EU members is impossible, if only because of the specificity of agricultural production in Slovenia. Therefore, it was necessary to define indicators that will express the added value of supply chains, while at the same time they will not stray too far from recognized and established definitions taken from internationally recognized literature.

The objective of this paper is to present indicators that measure added value in the specific livestock food supply chains (beef production, pork production and dairy production) and based on open or all available statistical databases, allowing for the evaluation of individual chains at an aggregate level.

MATERIAL AND METHODS

The indicator is defined in literature as a synthesise variable derived from two or more data (EEA, 1998), where the indicator exceeds the message of the data itself, which measures or describes the property of a particular phenomenon. Indicators are a tool for measuring changes in the actual situation or showing trends in the performance of the progress set or objectives (Korže, 2008). Indicators provide key information about a physical, social or economic system. They enable the analysis of trends and cause-and-effect relationships thus step beyond primary data (Veleva and Ellenbecker, 2001). The indicators are based on the objectives set and show different statistically processed data. They shall contain a description of the indicator itself, the area covered by it, the requested data source and be internationally comparable. Depending on the available database, the monitoring time interval of the indicator (Korže, 2008) is also determined.

In our research work, we carried out an overview of Slovenian and foreign literature in the field of indicators of added value or sustainability, and analyzed the accessibility and content of publicly available statistical databases. From publicly available statistical data, we have selected those that, with a logical and meaningful interpretation, enable the evaluation of agri-food chains. On the basis of scientific theory, statistical research methods and accessible statistical data, we have formed indicators of added value, which are intended for the evaluation of livestock agri-food chains at the aggregate level. The indicators presented are based on Slovenian and foreign scientific literature (Yakovleva, 2007; Malak-Rawlikowska et.al., 2019; Rossi, 2020), national (Agriculture Act, Livestock Farming Act) and internationally accepted legal objectives (The Farm to Fork Strategy, A European Green Deal, Biodiversity strategy for 2030) and internationally accepted indicators of sustainable development (Sustainable Development Goal 17, COSA – Committee on sustainability assessment, SAFA – Sustainability assessment of food and agriculture systems FAO), evaluate the added value in specific livestock chains at the aggregate level (beef production, pork production, dairy production) and are based on publicly available statistical data in the Republic of Slovenia: Statistical Office of the Republic of Slovenia, The Agricultural Institute of Slovenia (Model calculations, Report on the state of agriculture, food, forestry and fisheries), Agency for Agricultural Markets and Rural Development (Weekly market reports) and other databases. Given that the amount of data relating to the primary sector (primary producer – farmer) is relatively large and easily accessible, many indicators are designed in such a way that they relate mainly to the primary sector in each chain.

RESULTS AND DISCUSSION

Indicators of added value in food supply chains represent a tool for measuring changes in the actual situation or showing trends in the success of achieving the set progress or goals. The division of indicators into three groups (economic, social, environmental) is based on three aspects of sustainable development, whereby the dividing lines between individual areas of monitoring or evaluation are often blurred in the case of individual indicators. Sustainability represents an important challenge and a fundamental goal for all food value chains, as more and more different decision-makers strive to increase it. Not only the purchasing preferences of consumers, but also other stakeholders such as governments, environmental organizations and value chain actors who are nowadays aware of the need to improve sustainability in individual economic sectors (Schmitt et al., 2014). The presented indicators, created on the basis of publicly available databases and already established internationally recognized indicators, as well as Slovenian and international scientific literature, represent a tool for the evaluation or comparison of livestock food supply chains at the aggregate level in the Republic of Slovenia.

The presented indicators of added value in livestock supply chains were defined as part of scientific research, which represents a theoretical design for the further development of a qualitative multi-criteria decision model for the assessment or evaluation of added value in supply chains, based on the DEX methodology. The three aspects of sustainability or added value (economic, social and environmental) represent the basic parameters of the model, or those variables that illustrate the subproblems of the decision problem, i.e. those factors that define the quality of variants (Jereb et al., 2003). An individual parameter consists of individual criteria or attributes represented by defined indicators of added value.

When describing individual indicators, the very methodology of data use and the definition of added values is particularly important, as our goal is for the indicators or a derived a multi-criteria decision model, could be used in the future for data analysis or the evaluation of added value in different periods of time. The key is the methodology of using statistical data in a multi-criteria decision model and the definition of value stocks that enable the evaluation of an individual supply chain.

A main problem is the acquisition of data and the creation of indicators of added value for all further stages of the food chain (processing, distribution, trade), since only these are not publicly available or cannot be obtained from public collections of statistical data. A consequence of the gap in data availability is that the presented indicators are primarily intended to evaluate the position of the primary sector (farmers) in each chain, especially in terms of the economic and social aspect of added value.

CONCLUSIONS

The main objective of the indicators presented is to create a scientific research tool that enables or facilitates continuous monitoring of changing trends in the achievement of added value in individual food supply chains at the physical level, while allowing for the mutual comparison of the presence of added value in different livestock chains. The indicators presented reflect important sustainability issues in the food supply chain and should be analysed in conjunction with other issues. The property of all presented indicators is that they enable the evaluation of the added value of individual food supply chains in different periods of time, with the only limitation being the accessible time series of statistical data. This is important from the point of view of the development of a qualitative multi-criteria decision model for the assessment or evaluation of added value in the supply chain, based on the DEX methodology. When building a multi-criteria decision model DEX, the three aspects of sustainability or added value (economic, social and environmental) represent the basic parameters of the model, or those variables that illustrate the sub-problems of the decision problem, i.e. those factors that define the quality of variants.

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APPENDIX

Table 1: Methodology of indicators and data sources

Indicator	Methodology	Data Source
	Economic Indicators	
Ratio between producer price of agricultural product and agricultural input price	Average (year to year) ratio between producer agricultural producer price index and agricultural input price index at annual level: Z = average (year to year) ratio in n years X (ratio in each year) = producer price index of agricultural product / input price index total Z = (X1 + X2 +...+ Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Producer price indices of agricultural products (average 2015=100), Slovenia, annualy • Agricultural input price indices (average 2015=100), Slovenia, annually
Change in the retail price ratio and the cost price	Average (year to year) change in the ratio of the average retail selling price of agricultural products to the cost price, at the annual level in %: Z = average annual change in ratio in n years X (ratio in each year) = retail selling price / cost price Y (change in ratio between consecutive years, %) = ((X – X-1) / X-1)*100 Z = (Y1 + Y2 +...+ Yn) / n	Statistical Office of the Republic of Slovenia (SURS) • Average retail prices of goods and services, Slovenia, annually The Agricultural Institute of Slovenia (KIS) • Model calculations (Analytical calculation - animal husbandry)
Ratio between price of purchased products and the cost price	Average (year to year) ratio between average prices of purchased agricultural products and the cost price: Z = average (year to year) ratio in n years X (ratio in each year) = buying-in price / cost price Z = (X1 + X2 +...+ Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Quantities and average prices of purchased agricultural products, Slovenia, annually The Agricultural Institute of Slovenia (KIS) • Model calculations (Analytical calculation - animal husbandry)
Ratio between Slovenian and EU market price	Average (multi-annual) ratio of average market prices in Slovenia to average market prices in the EU Z = average (multi-year) ratio in n years X (annual ratio) = average market price in SLO / average market price in the EU Z = (X1 + X2 +...+ Xn) / n	Agency for Agricultural Markets and Rural Development (ARSKTRP) • Weekly market reports
Import-export ratio	Average (year to year) ratio of the quantities of goods imported and exported in each chain at an aggregate level in %: Z = average (year to year) ratio in n years X (ratio) = quantities of goods imported / quantities of goods exported Z = (X1+X2+...+Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Exports and imports by 4-digit code of the Combined Nomenclature and by countries, Slovenia, 2010 – 2019 • Exports and imports by 4-digit code of the Combined Nomenclature and by countries, Slovenia, annually (cummulative data)

Table 1: Methodology of indicators and data sources (*cont.*)

Indicator	Methodology	Data Source
Change in the ratio between the purchase price and retail selling price	Average (annual) change in the purchase price to retail price in %: Z = average annual change in ratio in n years X (ratio in each year) = purchase price / retail selling price Y (change in ratio between consecutive years, %) = ((X – X-1) / X-1)*100 Z = (Y1 + Y2 +...+ Yn) / n	Statistical Office of the Republic of Slovenia (SURS) • Quantities and average prices of purchased agricultural products, Slovenia, annually • Average retail prices of goods and services, Slovenia, annually
Social Indicators		
Ratio of average gross earnings of primary producers in each chain to average gross earnings in agriculture	Average (year to year) ratio between average gross earnings in each production chain and average gross earnings in Slovenia: Z = average (year to year) ratio in n years X (ratio in each year) = gross earnings in each chain / gross earnings in agriculture total Z = (X1 + X2 +...+ Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Average monthly earnings and index of average monthly earnings by legal persons by activities [NACE Rev. 2], Slovenia, monthly
Change in the ratio between the workforce in each chain and the workforce in all activities in Slovenia	Average annual change in the ratio of the employment population in each chain to the persons in employment in all activities in Slovenia total, in % (as compared to the situation in year q): Z = average annual change in ratio in q years X (ratio in each year) = workforce in each activity/ workforce in all activities total Y (change in n years in %) = ((Xn – Xq) / Xq) * 100 Z = Y / q	Statistical Office of the Republic of Slovenia (SURS) • Persons in employment by activities (NACE Rev. 2) and by employment status, Slovenia, annually
Ratio between the change in the level of salery and the change in the level of consumer prices	Average (multi-month) ratio of the wage index in each agricultural activity to the consumer price index: Z = average (multi-year) ratio in n months X (month-specific ratio) = index of earnings in each activity / index of consumer prices Z = (X1 + X2 +...+ Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Average monthly earnings and index of average monthly earnings by legal persons by activities [NACE Rev. 2], Slovenia, monthly • Consumer price indices by ECOICOP classification, Slovenia, monthly
Self-sufficiency rate	Average self-sufficiency rate of individual products or sector-specific products: Z = average self-sufficiency in n years Y = self-sufficiency level in year x Z = (Y1 + Y2 +...+ Yn) / n	The Agricultural Institute of Slovenia (KIS) • Reports on the state of agriculture (Report on the state of agriculture, food, forestry and fisheries)
Employment ratio of women and men in each activity in the chain	Average (multi-annual) ratio of the number of women and men employed in each activity or at each stage in the chain in %: Z = average (multi-year) ratio in n years X (ratio in a given year) = number of women employed / number of men employed Z = (X1 + X2 +...+ Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Persons in employment by activity (NACE Rev. 2), educational attainment and sex, Slovenia, annually
Gender pay gap	Average (year to year) ratio between the amount of women's average earnings and the amount of the average salary of men in each activity or at each stage in the chain in %: Z = average (year to year) ratio in n years X (ratio in each year) = amount of women's salary / salary level of men Z = (X1 + X2 +...+ Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Gender pay gap by activity (Nace Rev. 2), Slovenia, annually

Table 1: Methodology of indicators and data sources (*cont.*)

Indicator	Methodology	Data Source
Environmental Indicators		
Food milles	Food milles – average route/distance of imports in the last 10 years, route or distance is calculated according to the distance between Ljubljana and the capital of each import country and the share of imports from each country: Share of imports from each country = quantity of imports from each country / quantity of imports from all countries total Length of imports from each country in the share of total imports = share of imports from each country * distance (between Ljubljana and the capital of that country, in km) Sum of import lengths from each country as a proportion of total imports Average distance transported in each chain (in km) = Sum of import lengths from each country in proportion of total imports / 100	Statistical Office of the Republic of Slovenia (SURS) • Exports and imports by 4-digit code of the Combined Nomenclature and by countries, Slovenia, 2010 – 2019 • Exports and imports by 4-digit code of the Combined Nomenclature and by countries, Slovenia, annually (cummulative data)
Change in the ratio between the native breeds of animals and all breed animals combined	Average (year to year) change in the proportion of all farmed animals of the indigenous breeds of each species compared to all animals reared in each species in %: Z = average year to year change in ratio in n years X (ratio in each year) = number of indigenous animals (individual species) / number of all animals (individual species) Y (change in ratio between consecutive years, %) = ((X – X-1) / X-1)*100 Z = (X + X-1 +...+ Xn) / n	Statistical Office of the Republic of Slovenia (SURS) • Number of livestock, Slovenia, annually Ministry of Agriculture, Forestry and Food • Breed register with zootechnical assessment
Change in the number of farms included in the animal welfare sub-measure	Average year to year change in the number of livestock farms included in the animal welfare sub-measure, in %: Z = average year to year change in the number of farms (%) X (in each year = number of farms included in the sub-measure Y (change in number of farms between consecutive years, %) = ((X – X-1) / X-1)*100	The Agricultural Institute of Slovenia (KIS) • Reports on the state of agriculture (Report on the state of agriculture, food, forestry and fisheries)
Change in the ratio of organically breed animals	Average year to year change in the proportion of organically reared animals of each species compared to all farmed animals of that species in %: Z = average annual change in ratio X (ratio in each year) = number of EC animals (individual species) / number of all animals (individual species) Y (change in ratio between consecutive years, %) = ((X – X-1) / X-1)*100 Z = (X + X-1 +...+ Xn) / n	The Agricultural Institute of Slovenia (KIS) • Reports on the state of agriculture (Report on the state of agriculture, food, forestry and fisheries)

Table 2: Description and meaning of indicators

Indicator	Description and Meaning off Indicator
Economic Indicators	
Ratio between producer price of agricultural product and agricultural input price	This indicator shows the change in the producer price of agricultural products on an annual basis compared to the prices of agricultural inputs. The added value for the primary producer in the chain occurs if, during the period analysed, input prices have increased more slowly than those of agricultural products by producers. All value ratios greater than 1,00 represent added value for primary producer. This ratio between the producer's price of the agricultural product and the price of agricultural inputs also applies sensibly to other stakeholders in the chain (the added value for the stakeholder in the chain occurs if, during the analyzed period, input prices have increased slower than the prices of its products).
Change in the retail price ratio and the cost price	This indicator shows the average annual change in the ratio between the average retail selling price of agricultural products and the cost price of agricultural products during the selected period analysed, expressed as a percentage (%). Value added in the chain (from primary producer to consumer) occurs if the average annual change in ratio is positive, i.e. during the selected period the retail selling price of the agricultural product increased faster than its own production costs during the selected period.
Ratio between price of purchased products and the cost price	This indicator shows the ratio between the average price of purchased agricultural products and the cost price, i.e. the price necessary for the production or production of these products. The added value for the primary producer in each chain occurs if, during the selected period, the prices of purchased agricultural products were higher than the cost price. Given that the objective of each producer is to make a profit, it is very important that the turnover is higher than the cost of production itself or that the value of the ratio is greater than 1,00.
Ratio between Slovenian and EU market price	This indicator shows the ratio of the average market price of agricultural products in each chain on the Slovenian market to the EU market. Value added in chains occurs if the market price of the products in each (selected) country was equal to or higher than the average price on the EU market, or if the value of the ratio was equal to or greater than 1,00.
Import-export ratio	This indicator shows the average annual correlation between the import and export of goods in each chain over the selected period analysed. Value added in the chain occurs if, during the period chosen, the ratio between imports and exports of products in each chain was equal or less than 1,00, which means that the quantities of goods exported prevailed over the quantities of imported goods.
Change in the ratio between the purchase price and retail selling price	This indicator shows the average annual change in the ratio between the average purchase price of agricultural products and the retail selling price of agricultural products in the selected period analysed, expressed as a percentage (%). The added value for the primary producer in the chain occurs if the average annual change in ratio is positive, i.e. during the period selected, the purchase price of the agricultural product increased faster than the retail selling price of the product.
Social Indicators	
Ratio of average gross earnings of primary producers in each chain to average gross earnings in agriculture	This indicator shows the ratio between the average gross earnings of primary producers in each chain and the average gross earnings in agriculture in the Republic of Slovenia. The added value for the primary producer in each chain (beef production, pork production, dairy production) occurs if, during the selected period, its average earnings were equal to or higher than the average salary in primary agricultural sector or if the value of the ratio was equal to or greater than 1,00.
Change in the ratio between the workforce in each chain and the workforce in all activities in Slovenia	This indicator shows the change in the annual ratio between the number of working-age populations in each of the chains considered (beef production, pork production, dairy production) and the number of all working-age populations in the Republic of Slovenia in each year. It shows the trend of changing the structure of the workforce in each chain in the selected period compared to the total workforce in Slovenia. The added value is given if the trend of changing the proportion is positive in relation to the status or value of the ratio in the selected base year.
Ratio between the change in the level of salery and the change in the level of consumer prices	This indicator shows the ratio of changes in the level of wages in each agricultural activity and changes in the level of consumer prices. Changes in salaries and consumer prices are expressed in indices. All indices are calculated as the ratio between the current and the previous months. The added value for the primary producer in each chain (beef production, pork production, dairy production) occurs if, during the period chosen, the amount of their salary increased faster than the price of the consumer price or if the value of the ratio was equal to or greater than 1,00.

Table 2: Description and meaning of indicators (*cont.*)

Indicator	Description and Meaning off Indicator
Self-sufficiency rate	This indicator shows the level of self-sufficiency with beef, pork and dairy in the Republic of Slovenia. The self-sufficiency rate shows the extent to which domestic production (from basic domestic product) covers domestic consumption (feed, food and industrial consumption). Value added in the chain occurs if the self-sufficiency rate is high, at least 75 %.
Employment ratio of women and men in each activity in the chain	Value added in the chain is given if the number of employees by gender at each stage or activities in the chain is harmonised during the selected period or the value of the ratio is (approximately) equal to 1,00.
Gender pay gap	This indicator shows the average gap between the amount of male and female salaries of employees in individual activities or at individual levels in the agri-food chain. The added value in the chain is given if the level of salary at each stage in the chain or in each activity during the selected period was the same high for both sexes. In this case, the desired value of the ratio between the amount of the woman's salary is 1,00.
Environmental Indicators	
Food milles	The route or distance carried out on average transport on imports of products in a particular chain is an important indicator of the sustainability of the chain itself, since transport has a significant impact on CO2 emissions, the welfare of live animals in transport, the freshness of the products,... The added value in the chain is given if the average transport route was more than 300 km.
Change in the ratio between the native breeds of animals and all breed animals combined	This indicator shows the average annual change in the proportion of native breeds in the common breed composition of a particular breed animal species. The purpose of this indicator is to calculate by the extent to which the proportion of farmed animals of native breeds of each species changes on average each year compared to the total population of that species. The added value in each chain is given if the value of the average change in the proportion between the number of animals of native breeds and the number of animals breed during the selected period was positive, which means that the proportion of animals of native breeds in each chain increased over the selected period.
Change in the number of farms included in the animal welfare sub-measure	This indicator shows the average annual change in the number of livestock holdings included in the animal welfare sub-measure. The purpose of this indicator is to calculate by the extent to which the number of holdings included in the animal welfare sub-measure changes on average each year. The added value in a given chain is given if the value of the average annual changes over the selected period was positive, which means that during this period the number of farms included in the animal welfare sub-measure increased.
Change in the ratio of organically breed animals	This indicator shows the change in the proportion of organically breed animals of each animal species compared to all animals breed by individual years. The purpose of this indicator is to calculate by the extent to which the share of organically breed animals of each species changes on average each year compared to the total population of that species. The added value in each chain is given if the value of the average annual changes over the selected period was positive, which means that the share of organically breed animals in each chain increased over the selected period.

Izražanje dodane vrednosti v verigah preskrbe s hrano

IZVLEČEK

Agroživilske verige z dodano vrednostjo so verige, ki ohranjajo pozitivne družbene, okoljske in skupnostne vrednote, vključene v proizvodni proces od primarnega pridelovalca do končnega potrošnika in zagotavljajo ekonomsko oziroma socialno vzdržnost ter okoljsko trajnost, s čimer predstavljajo obliko trajnostnega agroživilskega proizvodnega sistema. Vrednotenje dodane vrednosti v posamezni verigi temelji na kazalnikih, ki predstavljajo orodje za merjenje sprememb dejanskega stanja oziroma prikaz trendov uspešnosti doseganja zastavljenega napredka oziroma ciljev. Predstavljeni kazalniki so oblikovani na podlagi javno dostopnih statističnih podatkov in tuje literature ter omogočajo vrednotenje dodane vrednosti v različnih živinorejskih verigah na agregatni ravni (govedorejska, prašičerejska in mlečna veriga) in temeljijo na razpoložljivih javno dostopnih statističnih podatkih v Republiki Sloveniji. Potreba po oblikovanju kazalnikov dodane vrednosti v živinorejskih agroživilskih verigah izhaja iz velikih razlik v strukturnih spremembah sektorja in razvitosti ter gospodarske uspešnosti različnih živinorejskih panog.

Ključne besede: veriga preskrbe s hrano, dodana vrednost, indikatorji, trajnost, gospodarski, družbeni in okoljski vidik