# Suitability of administrative standard output (SO) database for the preparation of FADN/FSDN selection plans – case of Slovenia

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**Abstract**

**This paper presents selected outcomes of the analysis which was conducted as a part of the national project supporting the transition of FADN (Farm Accountancy Data Network) to FSDN (Farm Sustainability Data Network) in Slovenia and strengthening the core FADN. Up until the accounting year 2024, the FADN selection plans were based on the official statistical data on the structure of agricultural holdings, while afterwards they are based on the administrative standard output (SO) database (Record of Standard Output of Agricultural Holdings), managed by the Ministry of Agriculture, Forestry and Food of the Republic of Slovenia. This is also due to the project outcomes which show that using the yearly updated administrative database for the preparation of the FADN/FSDN selection plans could significantly improve the sample representativeness and credibility of the FSDN data in a longer term. In case of using the SO RKG database for the preparation of FADN/FSDN sampling plans, it was recommended to exclude beforehand those agricultural holdings, which do not meet the criteria of European comparable farms within the framework of statistical farm structure surveys, and to systematically strengthen and regularly assess the implementation of the FADN/FSDN selection plans.**

## Introduction

In 2025, FADN (Farm Accountancy Data Network) converted to FSDN (Farm Sustainability Data Network). While the FADN system was primarily focused on collecting micro-economic farm data, the FSDN extends to new farm sustainability topics (Implementing Regulation No. 2024/2746; 2024), mainly environmental and social, which will allow for a more comprehensive assessment of the sustainability of agriculture at the level of agricultural holdings.

With the conversion to FSDN, the FADN/FSDN database, based on harmonised methodology for all European Union (EU) countries, further gains on its status as the most important farm-level database for the assessment of farm-level sustainability, and for supporting evidence-based policy creation and evaluation (Strategic Dialogue on …, 2024; A Vision for Agriculture and Food, 2025).

In this paper, we present the selected outcomes of the national project aimed at strengthening the basic FADN and supporting the transition to FSDN system in order to support evidence-based agricultural policy in Slovenia (Kožar et al., 2024a and 2024b). Specifically, we present the outcomes of the analysis of the suitability of the administrative standard output (SO) database for the preparation of FADN/FSDN selection plans in Slovenia (Kožar et al., 2023). Up until the accounting year 2024, the FADN selection plans were based on the official statistical data on the structure of agricultural holdings (farm structure surveys), while afterwards they are based on the administrative SO database (Record of Standard Output of Agricultural Holdings – SO RKG), managed by the Ministry of Agriculture, Forestry and Food of the Republic of Slovenia (MAFF). This is also due to the project outcomes showing that using the yearly updated administrative database for the preparation of the FADN/FSDN selection plans could significantly improve the sample representativeness and credibility of the FSDN data in a longer term.

## Methodological approach

We analyzed FADN selection plans for the accounting years 2023 and 2024 and compared them with the data from the Record of Standard Output of Agricultural Holdings (hereafter SO RKG) for the year 2022, as well as for the years 2019, 2020 and 2023. Several comparisons were performed: population of agricultural holdings above the economic threshold of 4,000 EUR SO (i.e. economic size class ≥III) compiled from the annually updated SO RKG database (for the year n-1) compared with the FADN population based on the statistical data on structure of agricultural holdings, for different years. Analysis was performed at the level of principal types of farming and economic size classes as defined in the Commission Implementing Regulation (EU) 2024/2746 (2024), which states in Annex IV that for classifying agricultural holdings "*according to the Union farm typology (in which the type of farming is defined by main production activities) and for determining economic farm size, the Standard output (SO) is used*".

Standard output (SO) is a relatively simple economic indicator – the expected average ("standard") gross production of an agricultural holding, based on its production structure (Delegated Regulation No. 2024/1417, 2024). As mentioned, it enables classification of agricultural holdings into types of farming and economic size classes, thus enabling in-depth economic analyses at different levels of agriculture. The "*total SO of a holding is the sum of the individual production units of a specific holding multiplied by their respective SOC*" (Annex IV of the Implementing Regulation (EU) 2024/2746, 2024). "*Standard output coefficient (SOC) is the average monetary value of gross production of*

*each agricultural variable …, corresponding to the average situation in a given region, per unit of production… SOCs are updated at least every time a European survey on the structure of agricultural holdings is conducted."* (Annex IV of the Implementing Regulation (EU) 2024/2746, 2024). While the SOCs for the purpose of the statistical farm-structure survey are updated only when European surveys on farm structure are conducted (five-year average; Delegated Regulation No. 2024/1417, 2024), the SOCs (five-year averages) within the SO RKG database are annually updated. Principal types of farming and economic size classes, referenced in this paper are listed in Table 2 and 3 in Annex.

The calculation of the total SO at the level of individual agricultural holdings and integration of these data into the administrative data system of MAFF has significantly increased the usefulness and analytical value of these data in case of Slovenia (Zagorc et. al., 2022a, 2023 and 2024). Primarily, these data are used for monitoring the state of Slovenian agriculture and enable evidence-based agricultural policy creation and implementation at different levels (e.g., calculation of economic threshold for participation in specific policy measures of the current strategic CAP plan for 2023–2027).

## RESULTS

As presented in Table 1, the year-on-year changes in the number of agricultural holdings included in the calculation of the SO at the aggregate level are usually less than one percent, while the number of agricultural holdings included in FADN selection plans vary between years. The number of agricultural holdings in the selection plan for 2024 was at the level of the selection plan for 2023. Further there was also almost no change between 2021/2020, while the differences were larger between datasets for 2022 and 2021 (–4%) and 2023 and 2022 (+6%) (more results in Kožar et al., 2024a). Larger year-on-year changes in the total number of agricultural holdings and by type of farming in the FADN selection plans occur in those years when the newer data on the typology and economic size of holdings from the farm structure surveys, which are not conducted annually by the Statistical Office of Slovenia, were taken into account.

**Table 1.** Comparison of populations of agricultural holdings above FADN economic threshold (from 4,000 EUR SO or economic size class ≥III) in the administrative SO RKG database for years 2022 and 2023, and in the FADN selection plans for accounting years 2023 and 2024.

| Index SO RKG 2023[a]/ SO RKG 2022[a] (population SO RKG 2022 = 100) | | | | | | | Index FADN selection plan 2024[a] / FADN selection plan 2023[a] (population FADN selection plan 2023 = 100) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Principal type of farming[b] | Economic size class[b] | | | | | Total ≥III | Principal type of farming[b] | Economic size class[b] | | | | | Total ≥III |
| | III | IV+V | VI+VII | VIII+IX | >IX | | | III | IV+V | VI+VII | VIII+IX | >IX | |
| 15+16 | 113 | 122 | 148 | 127 | 122 | **119** | 15+16 | 99 | 100 | 100 | 99 | 100 | **99** |
| 21+22+23 | 101 | 87 | 95 | 122 | 183 | **96** | 21+22+23 | 98 | 97 | 103 | 104 | 133 | **101** |
| 35 | 94 | 96 | 101 | 103 | 92 | **97** | 35 | 98 | 99 | 99 | 100 | 100 | **99** |
| 36+37+38 | 101 | 103 | 108 | 130 | 100 | **104** | 36+37+38 | 99 | 99 | 100 | 98 | 100 | **99** |
| 45 | 31 | 55 | 78 | 112 | 125 | **81** | 45 | 102 | 100 | 100 | 100 | 100 | **100** |
| 46 | 95 | 108 | 114 | 126 | 50 | **104** | 46 | 100 | 100 | 100 | 100 | 100 | **100** |
| 47 | 66 | 87 | 163 | 155 | | **117** | 47 | 100 | 100 | 100 | 100 | | **100** |
| 48 | 104 | 104 | 114 | 120 | | **104** | 48 | 99 | 99 | 100 | 100 | | **99** |
| 51+52+53 | 57 | 60 | 69 | 98 | 106 | **81** | 51+52+53 | 100 | 100 | 100 | 99 | 100 | **100** |
| 61 | 98 | 111 | 97 | 80 | 133 | **101** | 61 | 99 | 99 | 100 | 100 | 100 | **99** |
| 73+74 | 83 | 93 | 89 | 98 | 200 | **88** | 73+74 | 100 | 100 | 99 | 100 | 100 | **100** |
| 83+84 | 96 | 104 | 114 | 111 | 78 | **102** | 83+84 | 100 | 100 | 100 | 100 | 100 | **100** |
| **Total** | **99** | **104** | **99** | **111** | **112** | **101** | **Total** | **99** | **100** | **100** | **100** | **101** | **100** |

| Index SO RKG 2022[a] / FADN selection plan 2024[a] (population FADN selection plan 2024 = 100) | | | | | | | Index SO RKG 2023[a] / FADN selection plan 2024[a] (population FADN selection plan 2024 = 100) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Principal type of farming[b] | Economic size class[b] | | | | | Total ≥III | Principal type of farming[b] | Economic size class[b] | | | | | Total ≥III |
| | III | IV+V | VI+VII | VIII+IX | >IX | | | III | IV+V | VI+VII | VIII+IX | >IX | |
| 15+16 | 129 | 123 | 82 | 67 | 82 | **120** | 15+16 | 147 | 149 | 122 | 85 | 100 | **143** |
| 21+22+23 | 298 | 223 | 198 | 153 | 150 | **211** | 21+22+23 | 300 | 193 | 187 | 187 | 275 | **201** |
| 35 | 94 | 84 | 75 | 108 | 120 | **86** | 35 | 89 | 80 | 76 | 111 | 110 | **84** |
| 36+37+38 | 67 | 72 | 94 | 131 | 140 | **74** | 36+37+38 | 67 | 74 | 101 | 171 | 140 | **77** |
| 45 | 74 | 83 | 92 | 118 | 150 | **94** | 45 | 23 | 46 | 72 | 132 | 188 | **76** |
| 46 | 101 | 114 | 113 | 120 | 100 | **108** | 46 | 96 | 123 | 128 | 152 | 50 | **112** |
| 47 | 110 | 111 | 83 | 126 | | **100** | 47 | 72 | 96 | 135 | 196 | | **117** |
| 48 | 145 | 146 | 103 | 100 | | **142** | 48 | 150 | 151 | 116 | 120 | | **148** |
| 51+52+53 | 102 | 118 | 141 | 141 | 157 | **133** | 51+52+53 | 58 | 71 | 98 | 138 | 165 | **108** |
| 61 | 101 | 98 | 103 | 138 | 150 | **101** | 61 | 99 | 110 | 100 | 110 | 200 | **103** |
| 73+74 | 111 | 126 | 125 | 116 | 200 | **119** | 73+74 | 92 | 117 | 111 | 114 | 400 | **105** |
| 83+84 | 90 | 86 | 96 | 94 | 180 | **89** | 83+84 | 86 | 89 | 109 | 105 | 140 | **90** |
| **Total** | **103** | **102** | **97** | **115** | **138** | **102** | **Total** | **102** | **106** | **96** | **127** | **155** | **103** |

[a] Note: SO RKG 2022: population MAFF for year 2022, SOC coefficients "2019" (average for the period 2017–2021); SO RKG 2023: population MAFF for year 2023, SOC coefficients "2020" (average for the period 2018–2022); FADN selection plan for accounting year 2023: population for year 2022 (by Statistical Office of Republic of Slovenia), SOC coefficients "2017" (average for the period 2015–2019); FADN selection plan for accounting year 2024: population for year 2023 (by Statistical Office of Republic of Slovenia), SOC coefficients "2017" (average for the period 2015–2019).

[b] Principal types of farming and economic size classes, referenced in Table 1, are listed in Annex.

Source: Record of Standard Output of Agricultural Holdings – aggregate data (MAFF); FADN selection plans for the accounting years 2023 and 2024 (MAFF); own calculations

At the time of preparation of the FADN selection plan for accounting year 2024 (October 2023), in the administrative SO database (Record of Standard Output of Agricultural Holdings) data for the year 2022 were available. In this administrative SO database for 2022, at the aggregate level (economic size class ≥III) the number of agricultural holdings exceeded the number of agricultural holdings in the FADN selection plan for 2024 by 2%. The largest differences were, similar for all analyzed years, calculated for the specialist horticulture holdings (types of farming: 21+22+23). The SOC coefficients for these types are calculated in more detail at lower levels of principal types of farming in case of the administrative SO RKG database compared to the official EU survey statistical methodology. For specialist field crops holdings (types of farming: 15+16), a larger difference in the number of agricultural holdings can be observed due to beforehand mentioned more detailed SOCs and also due to the high prices of agricultural products in 2022 (SOC coefficients "2020" used: average for the period 2018–2022), which were not yet available in the selection plan for 2024 (SOC coefficient "2017" used: average for the period 2015–2019). There are significantly less agricultural holdings among specialist permanent crops holdings (types of farming: 36+37+38) in the SO RKG database, which is a result of more exceptionally poor harvests in the intensive orchards in the period 2018–2022 (reflected in the SO RKG database for year 2022 – SO RKG 2022) than in the period 2015–2019 (reflected in the FADN selection plan for the accounting year 2024).
One of the major advantages of the administrative SO RKG database compared to the farm structure survey data is the annual updating of SOC coefficients, which are a multiplier of the farm-level production data (area, hectare yields, animals, live weight gains, bee colonies) from MAFF's administrative registers and databases and prices of agricultural products. This results in relatively smaller interannual fluctuations in the number of agricultural holdings in population and in the structure of population by production types and economic size classes. This is also evident from the Fig. 1 showing relative stability of the number of agricultural holdings by principal production types among different years. Further in years, when the agriculture structural surveys are conducted or in typical years (production-wise), the outcomes are very similar (Kožar et al., 2024a). Changes of bigger magnitude can be a consequence of extreme price/production fluctuations, e.g. price surge in types 15 and 16 (both specialist field crops) in year 2023 compared to 2020 or structural changes in types 45 (specialist dairy) and 46 (specialist cattle – rearing and fattening) in year 2023 compared to 2020.

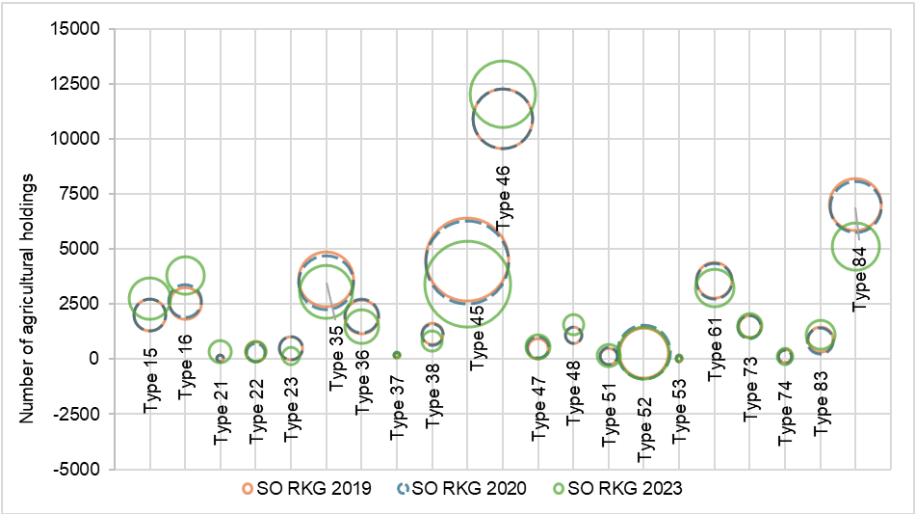


*Figure 1. Population of agricultural holdings above FADN threshold (4,000 EUR SO or economic size class ≥III): Comparing administrative SO RKG database for three years (2019, 2020, 2023) by principal type of farming[a] (bubble size: share of total SO of Slovenian agriculture).*

[a] Principal types of farming, referenced in Fig. 1, are listed in Annex (Table 2).

Source: Record of Standard Output of Agricultural Holdings – aggregate data (MAFF; presented also in Zagorc et. al., 2022a, 2023 and 2024); own calculations

## DISCUSSION

The key advantage of using the administrative SO register for preparing the FADN/FSDN sampling plan is the annual calculation of the SO of agricultural holdings based on updated SOC coefficients (average of the last five consecutive years) and data on areas and livestock on agricultural holdings from the MAFFS's administrative registers and databases. This way, the information on the economic size class and type of farming of the agricultural holding is more precise and up to date, which is crucial in the circumstances of rapid structural changes in the Slovenian agriculture (Kožar et al., 2024a).
One potential disadvantage of using the administrative SO data for the preparation of FADN/FSDN sample plans could be that although the methodology for estimating the SO of agricultural holdings (Pravilnik …, 2023) does largely take into account the EU legislation, there are certain deviations. This could lead to weaker comparability with the approaches of preparing FSDN sample plans in other EU countries. The outcomes of our analysis show that the number of agricultural holdings included in the SO RKG database at the aggregate level exceed the agricultural holdings population according to the official statistical data and that certain deviations by types of farming and

economic size classes remain, however as shown in the results chapter, they are explainable (Zagorc et al., 2022b). In case of using the SO RKG database for the preparation of FADN/FSDN sampling plans, it was recommended to exclude beforehand those agricultural holdings, which do not meet the criteria of European comparable farms within the framework of statistical surveys of the structure of agricultural holdings.
An overall project recommendation (Kožar et al., 2024a) was to systematically strengthen and regularly assess the implementation of the FADN/FSDN selection plans and further, to systematically collect additional metrics and information about the FADN/FSDN population to upgrade the statistical evaluation of the sample representativeness and of the reliability of the selected FADN/FSDN variables.

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## ANNEX: GENERAL AND PRINCIPAL TYPES OF FARMING AND GROUPED ECONOMIC SIZE CLASSES

**Table 2.** General and principal types of farming (Source: Implementing Regulation No. 2024/2746 (2024): Annex IV)

| General type of farming | Principal type of farming |
|---|---|
| **1. Specialist field crops** | 15. Specialist cereals, oilseeds and protein crops |
| | 16. General field cropping |
| **2. Specialist horticulture** | 21. Specialist horticulture indoor |
| | 22. Specialist horticulture outdoor |
| | 23. Other horticulture |
| **3. Specialist permanent crops** | 35. Specialist vineyards |
| **3. Specialist permanent crops** | 36. Specialist fruit and citrus fruit |
| | 37. Specialist olives |
| | 38. Various permanent crops combined |
| **4. Specialist grazing livestock** | 45. Specialist dairy |
| **4. Specialist grazing livestock** | 46. Specialist cattle – rearing and fattening |
| | 47. Cattle — dairy, rearing and fattening combined |
| | 48. Sheep, goats and other grazing livestock |
| **5. Specialist granivores** | 51. Specialist pigs |
| | 52. Specialist poultry |
| | 53. Various granivores combined |
| **6. Mixed cropping** | 61. Mixed cropping |
| **7. Mixed livestock** | 73. Mixed livestock, mainly grazing livestock |
| | 74. Mixed livestock, mainly granivores |
| **8. Mixed crops — livestock** | 83. Field crops – grazing livestock combined |
| | 84. Various crops and livestock combined |

**Table 3.** Grouped economic size classes of holdings (Source: Adapted from Implementing Regulation No. 2024/2746 (2024): Annex V)

| Grouped economic size classes | Limits in EUR |
|---|---|
| III | from 4 000 to less than 8 000 |
| IV+V | from 8 000 to less than 25 000 |
| VI+VII | from 25 000 to less than 100 000 |
| VIII+IX | from 100 000 to less than 500 000 |
| >IX (classes IX, X, XI, XII, XIII, and XIV) | from 500 000 |