



Универзитет “Кирил и Методиј” (УКИМ),
Факултет за земјоделски науки и храна – Скопје (ФЗНХ),
Институт за биотехнологија (ИАБ)
Катедра за сточарство – Оддел за свињарство



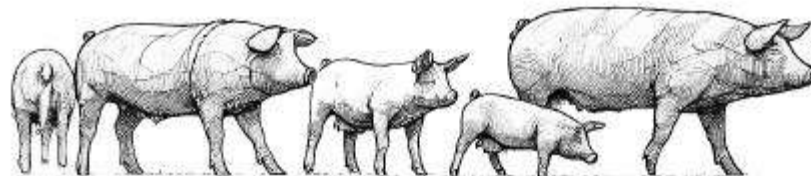
Pig production in North Macedonia and importance of biosecurity in the country

Vuković V. ¹, Andonov S. ^{1,2} and Simović M. ³

*University of St. Cyril and Methodius" - Faculty of agricultural Sciences and Food Skopje,
Republic of North Macedonia¹*

Swedish Agriculture University - SLU ²

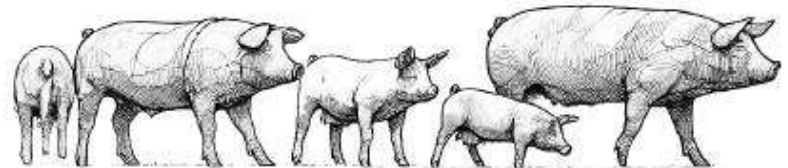
³ Food and Veterinary Agency, North Macedonia



BETTER COST Meeting 4-5 February, 2025 – Skopje, Macedonia

Presentation content:

- i. *History* of Macedonian pig husbandry
- ii. Macedonian pig husbandry – *population* size, structure and *production*
- iii. Domestic *markets* of fresh pork and domestic market of meat products, *production of domestic meat*, imports of frozen pork and exports of meat products in the region
- iv. National *strategy* of pig husbandry 2021 to 2027 and
- v. Rural development and *biodiversity* programs – Primitive Macedonian Pigs
- vi. Larger producers and *farm results* compare to EU
- vii. Importance of *biosecurity* level and risk of ASF for Macedonian pig husbandry
- viii. Main *conclusions*



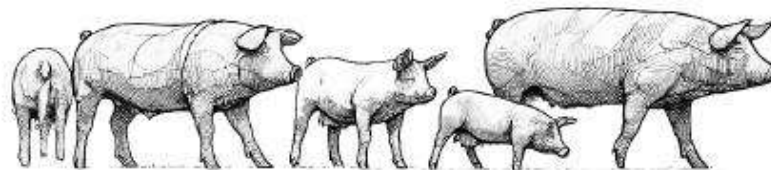
Short history of Macedonian pig husbandry

Pig production in the Republic of North Macedonia has a relatively long history, however the **most intensive development started in the early 80's**.

As a part of Ex-Yugoslavia, Macedonia was one of the federal republics where the **agricultural targets** were oriented toward the **production of a number of vegetables and crop products**.

Livestock production was mainly based on sheep production (light lambs and white and soft cheese), production of eggs, production of cow milk and yogurt and **pig meat for the Macedonian market of fresh meat**.

Since 2001 the project **Development of Macedonian hogs for quality pork** lead and executed by Topigs (Topigs Norsvin) was **boosting factor** for total pig industry via company Zito Vardar from Veles.

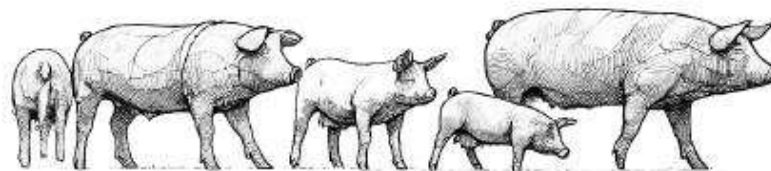


Macedonian pig husbandry – population size, structure and production

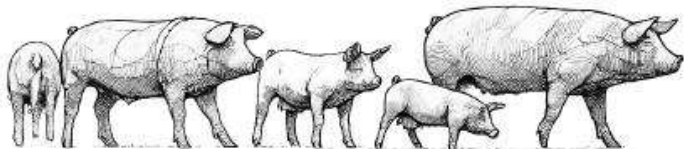
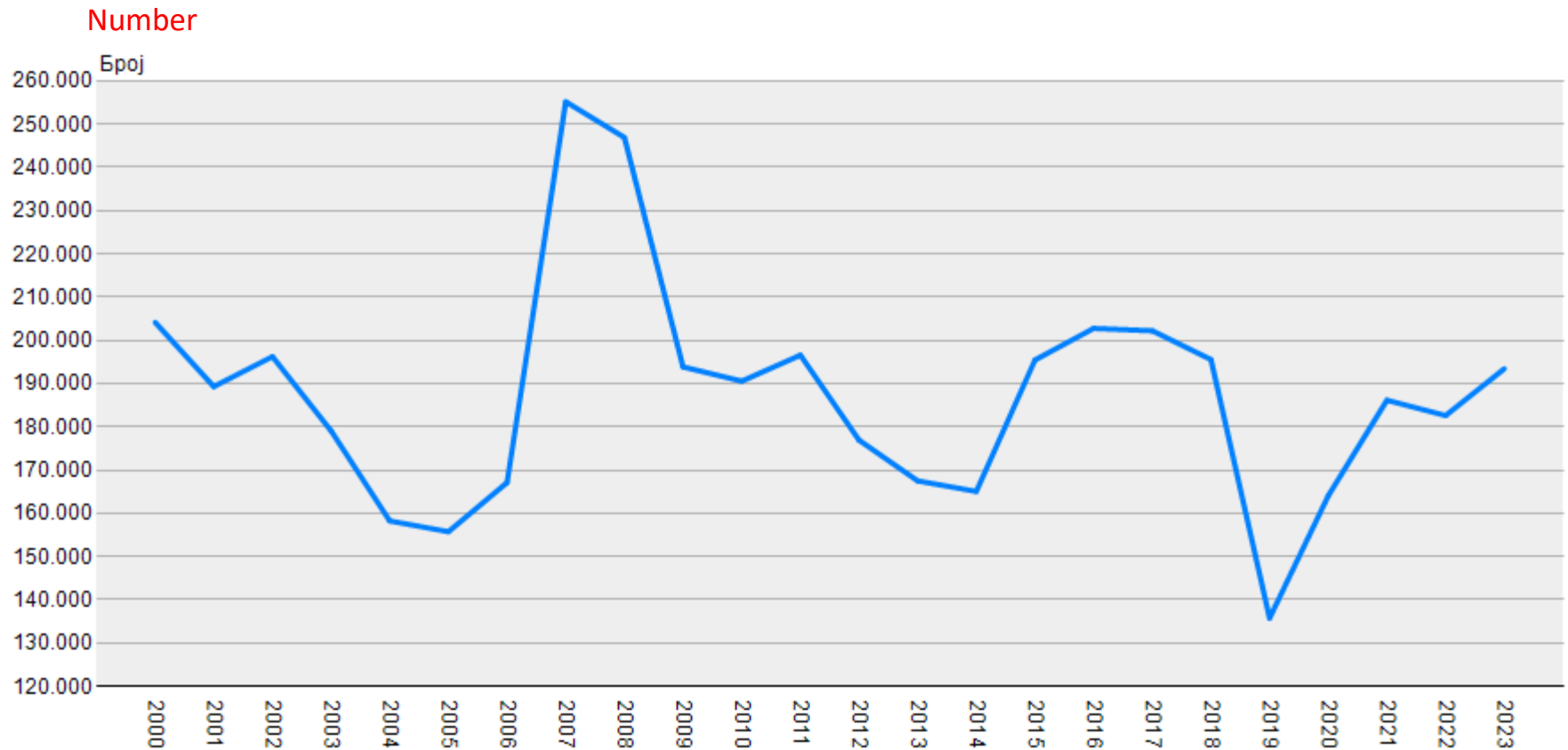
According to the State statistical bureau, the **number of total pigs** per head in the country for **2024 was 193412**.

The numbers reviewed by State statistical bureau, not fully expressed the real status of the population of domestic pigs vs. domestic pork production.

Detailed explanation about is published in National strategy of pig husbandry 2021 to 2027.

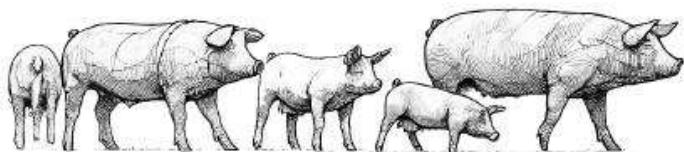
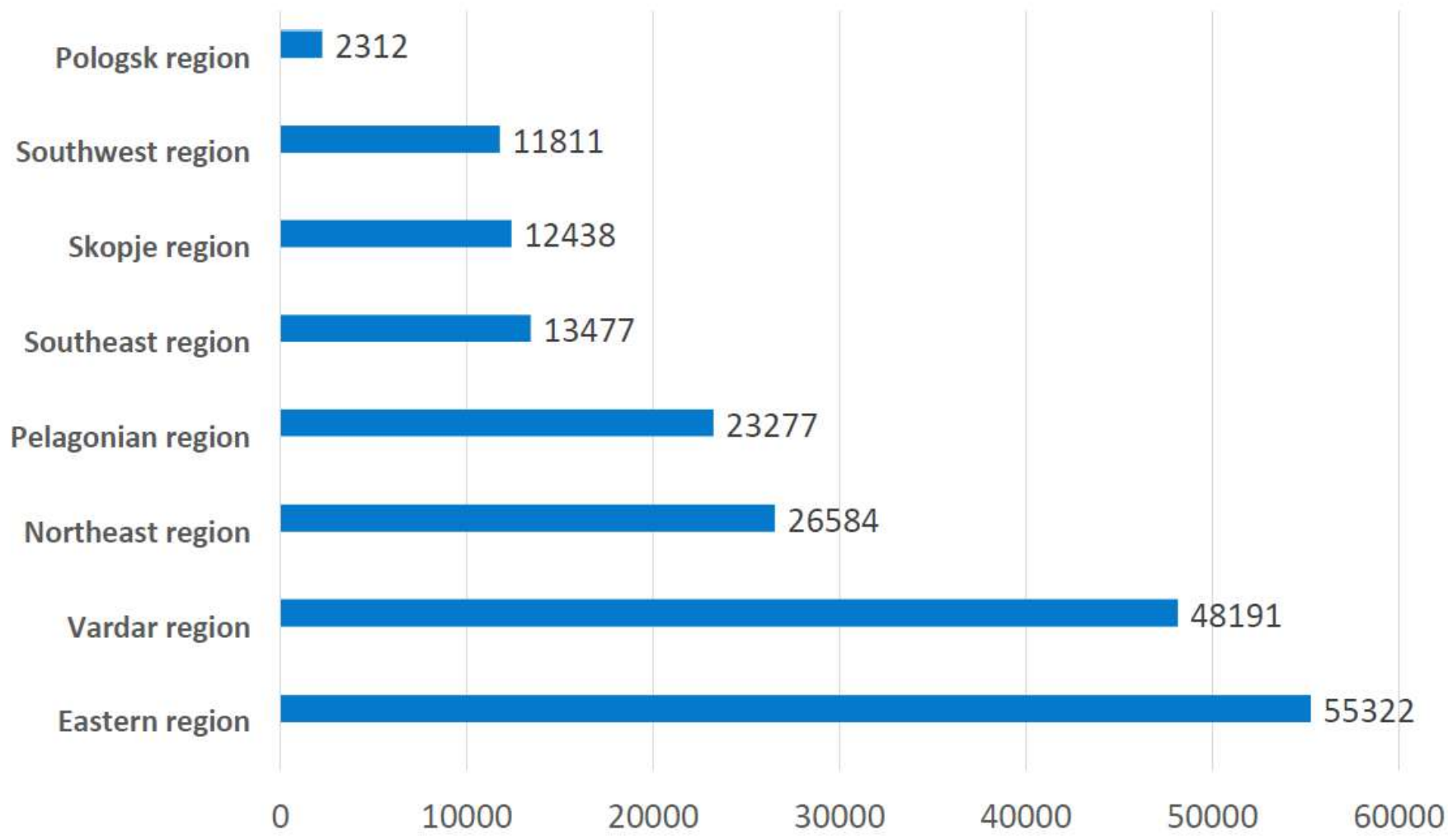


Trend of total number of pigs per year



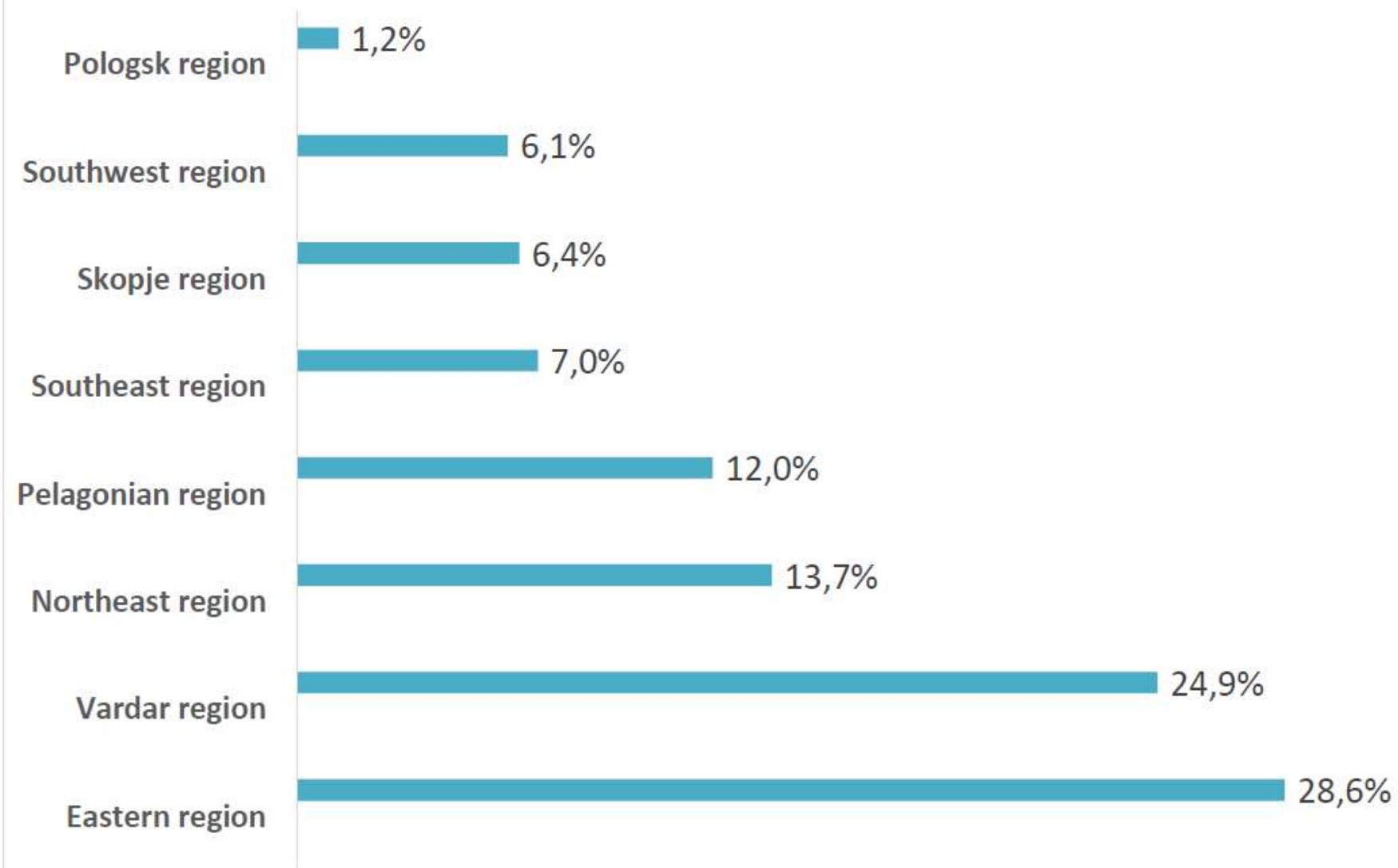
Source: State statistical office of N. Macedonia

Total number of pigs by region - 2023



Source: State statistical office of N. Macedonia

Total number of pigs by region - 2023 (%)

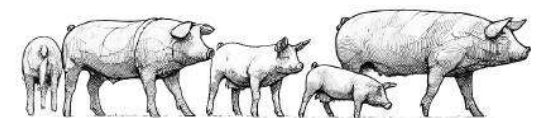
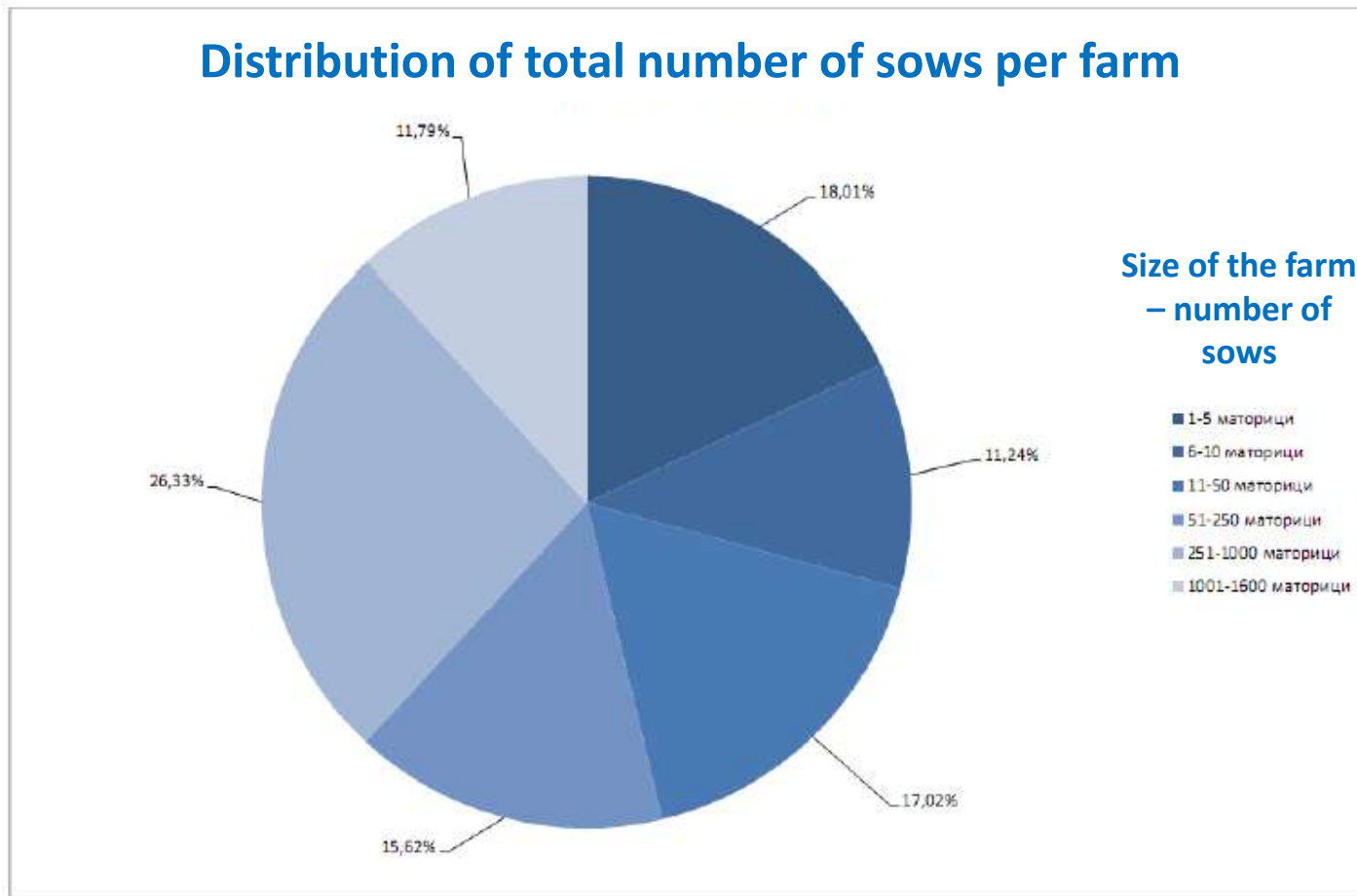


Source: State statistical office of N. Macedonia



Structure of pig Macedonian husbandry

Production in pig husbandry based on **relatively large industrial farms** and **many small and medium farms** was and still it is the status of the country!

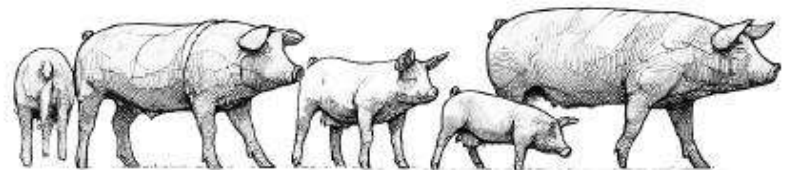


Macedonian pork production

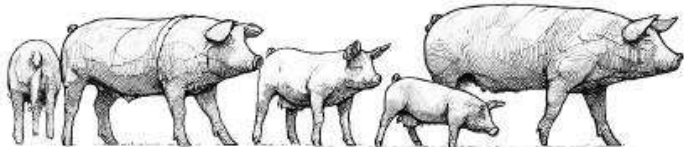
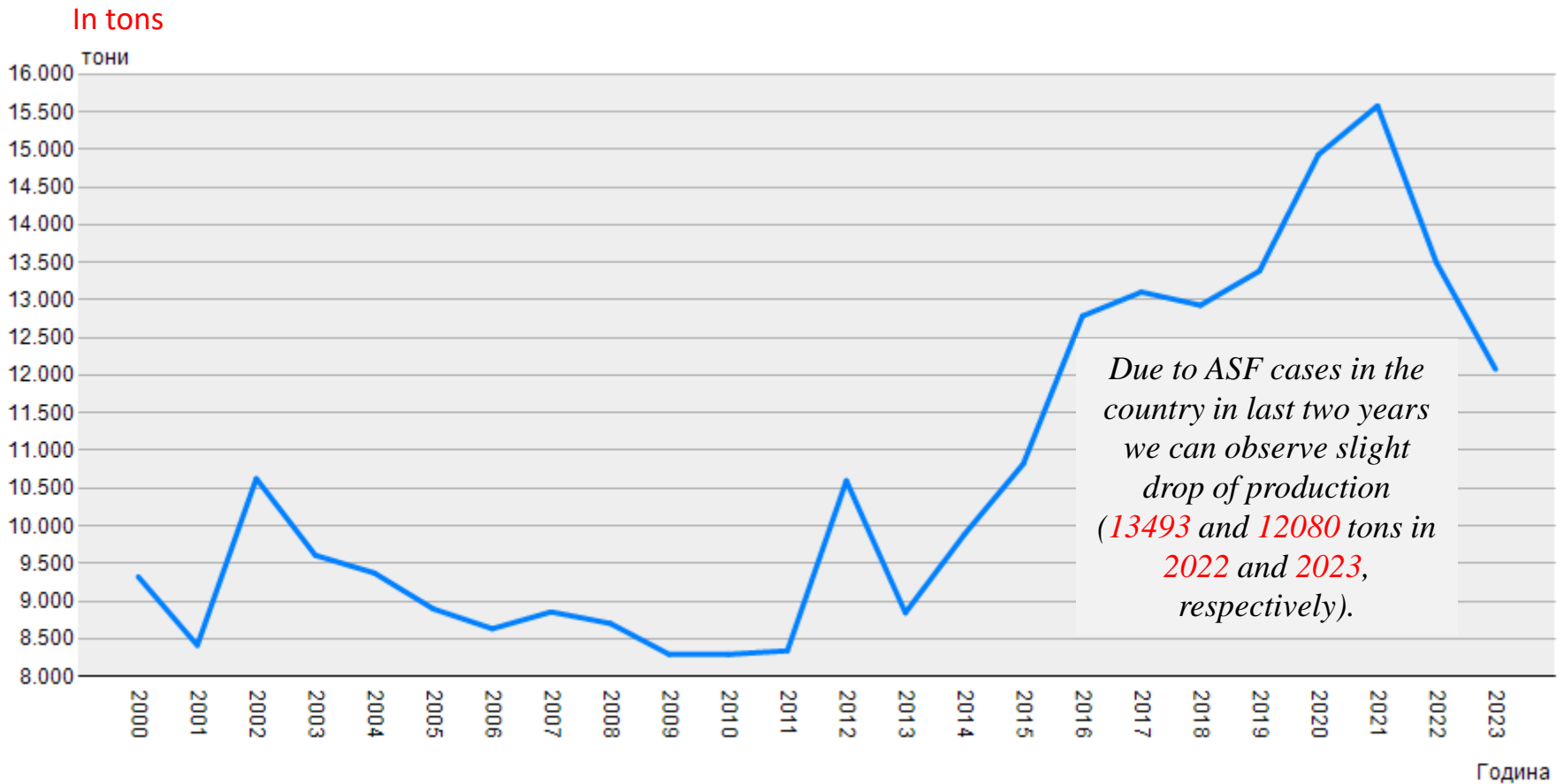
According to the same source, domestic pork production in the last ten years express **positive trend from 9886 tons in 2014 up to 15578 tons in 2021.**

Macedonian production of fresh pork is **100% sufficient** to cover the complete needs of domestic fresh pork market (*fresh consumption*)!

Based on total number of applications to Agency for Financial Support in Agriculture and Rural Development about Direct payments state measure “***Finishers delivered to the slaughterhouse***” – **186041 finishing pigs in 2024.** Can be estimated as quantity close to 15000 tons.

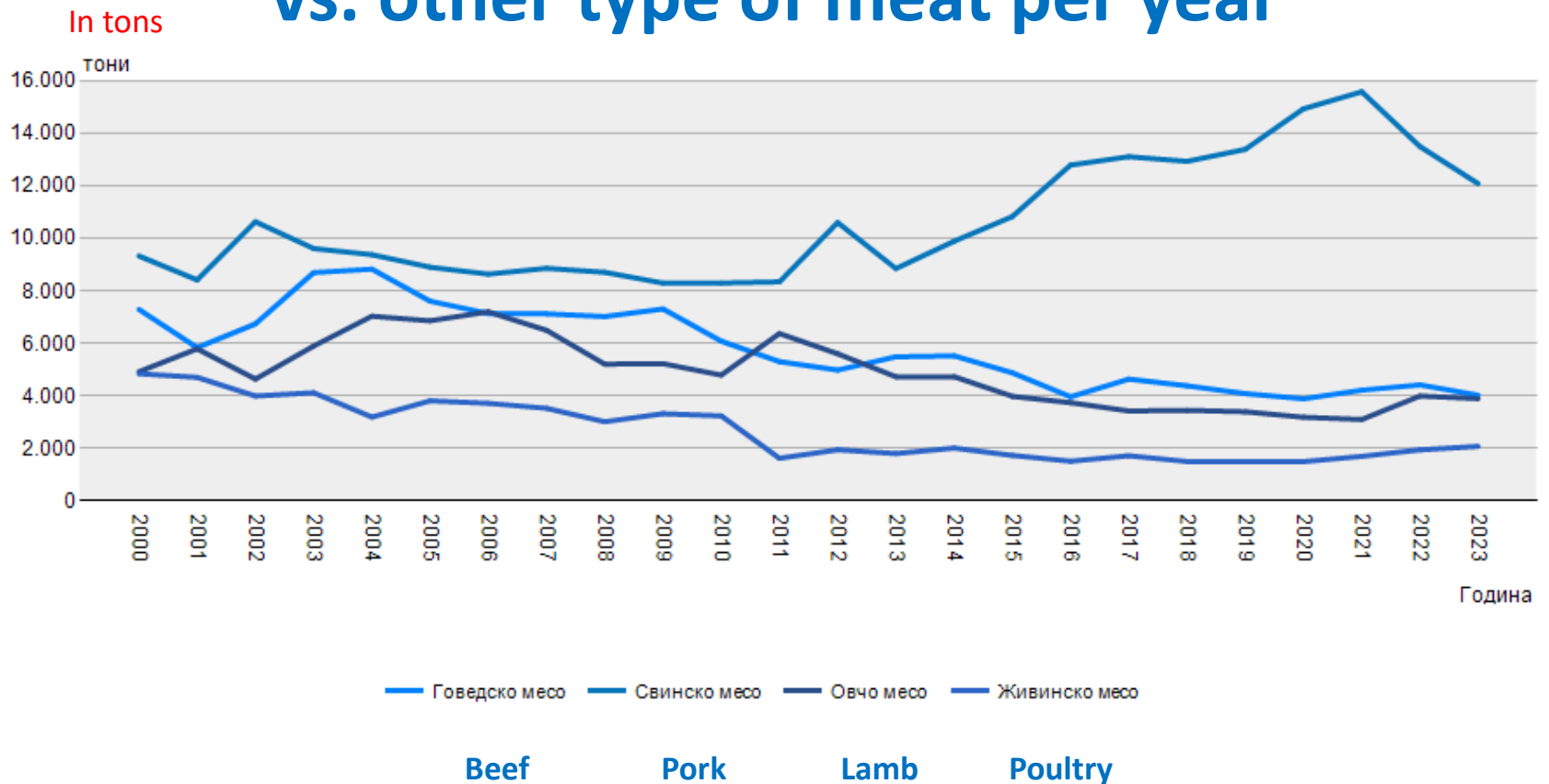


Trend of domestic production of pork per year



Source: State statistical office of N. Macedonia

Trend of domestic production of pork vs. other type of meat per year

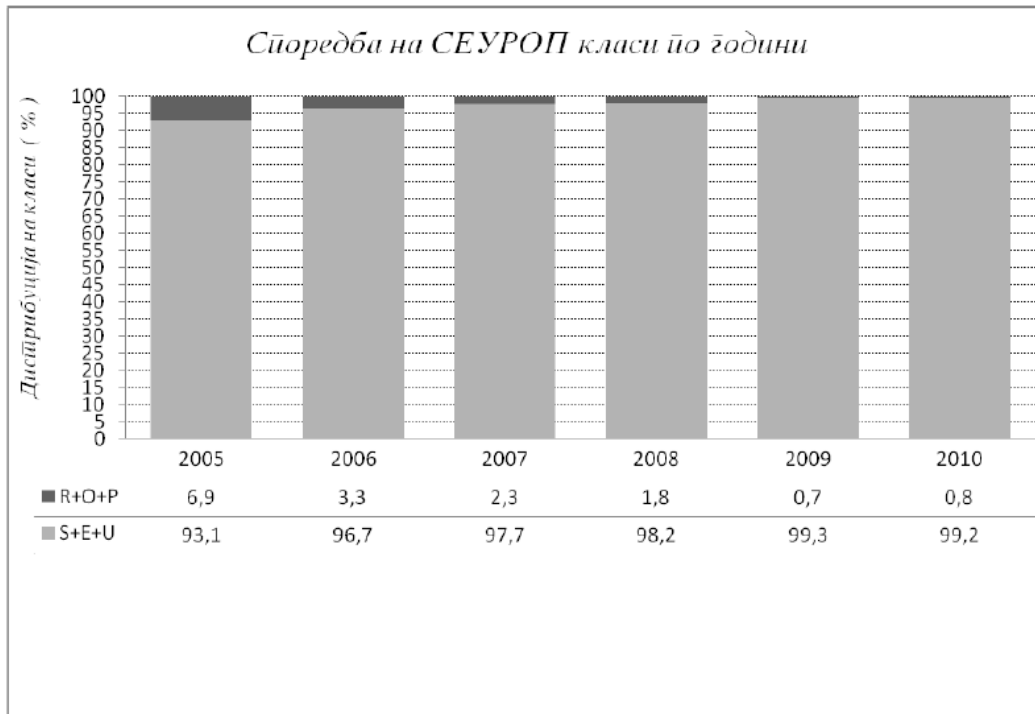


Source: State statistical office of N. Macedonia



SEUROP

Meat quality



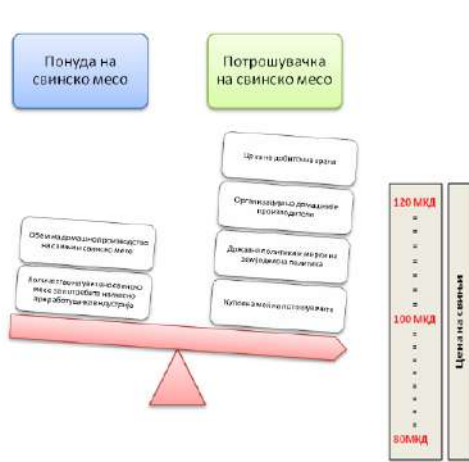
Графикон 28. Пожелни наспроти непожелни SEUROP класи по години (2005-2010)



Implemented SEUROP classification since 2001 and great results starting from 2005

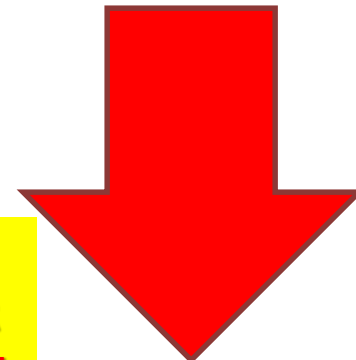
Pork quality is very high and informally confirmed. More scientific investigations and scientific arguments in the coming year.

Supply and demand of pork meat during the year and the market fluctuations

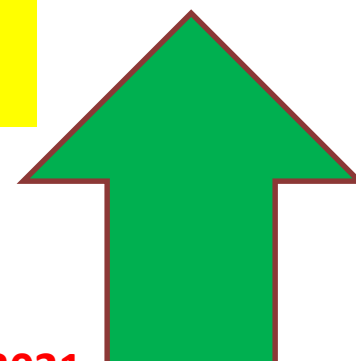


Слика 1. Понудата и потрошувачна на свинско месо и цената на свињите во Република Македонија

MARKET IS HIGHLY UNDER THE INFLUENCE OF POSSIBLE MEASURES AGAINST ASF!

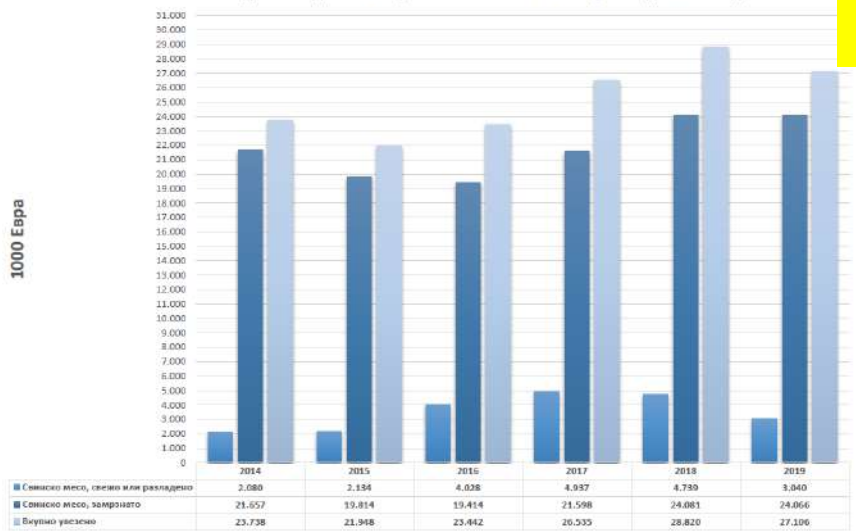


Imports of frozen pork



Exports of meat products into region

Одлив на девизи за увоз на свинско месо од 2014 до 2019 година



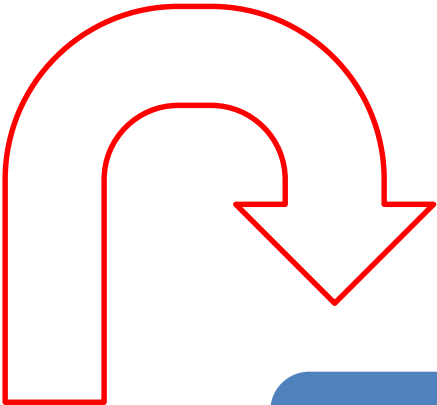
13260 tons in 2021 with an outflow of 29647000 euros

MACEDONIAN PIG HUSBANDRY

DOMESTIC MARKET OF LIVE PIGS AND PORK MEAT

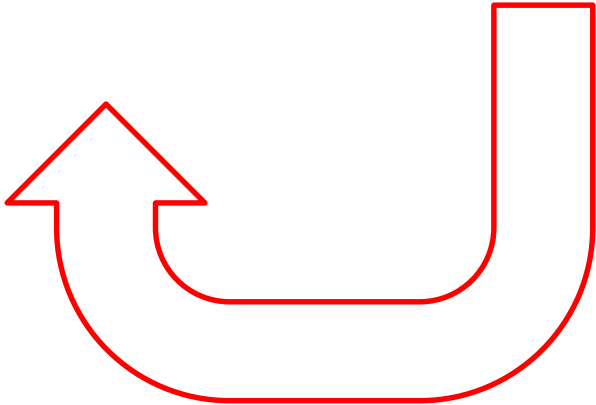
DOMESTIC FRESH PORK FOR CONSUMPTION

MEAT PROCESSING - DURABLE AND SEMI-DURABLE PORK PRODUCTS



100% satisfaction with domestic needs – estimated around **15578 tons** in **2021**.

5-10% satisfaction with domestic production, **90-95%** imports of frozen pork or about **13260 tons in 2021** with an **outflow of 29647000 euros**



MACEDONIAN PIG HUSBANDRY

KEY STRATEGIC OBJECTIVES of Macedonian Pig Husbandry National Strategy 2021-2027

Regulation of the domestic market

with the help of the measures foreseen in the national strategy.

Substitution of imported frozen and fresh pork in the first phase of 20-30%

Sustainable development

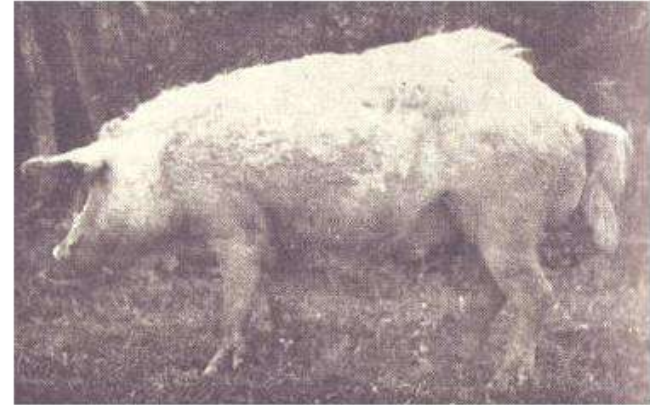
(energy saving, green and agricultural policy with rural development and pigs welfare) according to the national strategy.

Control and protection from ASF as a key threat to the sub-sector!

Rural development and biodiversity

Универзитет Св. Кирил и Методиј

Факултет за земјоделски науки и храна – Скопје



Слика 3. Нерез од расата шишка
(Белиќ, 1961)

ИЗВЕШТАЈ БИОЛОШКА РАЗНОВИДНОСТ
- СВИЊАРСТВО -

2024

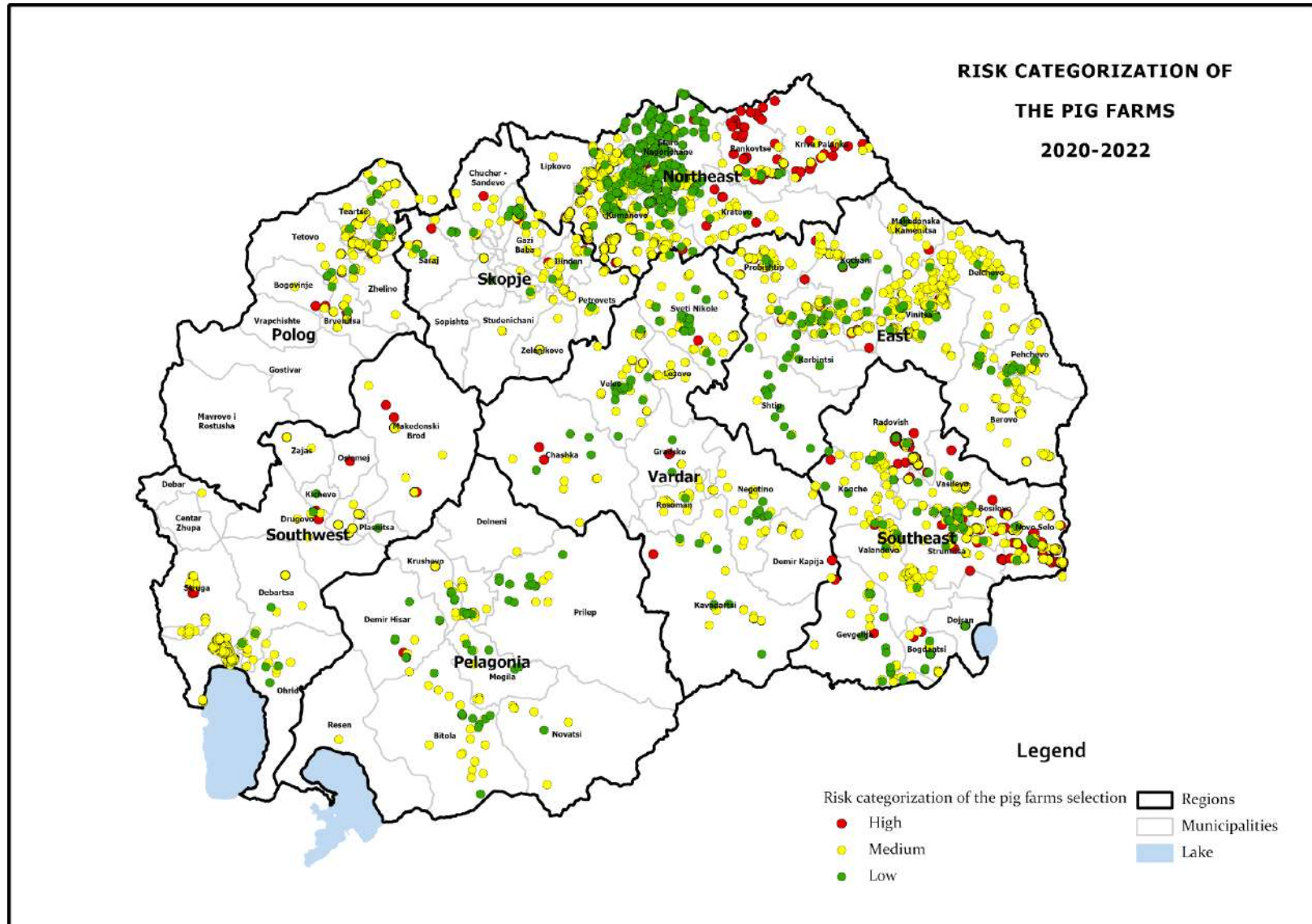


Primitive Macedonian Pigs

ASF vs. Macedonian pig husbandry

- **Since 2018**, complete pig sector and pig associations **GICKO** and **Makedonsko prase** are doing many various activities, in the first years to avoid introduction of ASF in the county and later to avoid spreading;
- The respond of the state and state **“real actions”** toward minimising the impact of ASF we can estimate as **very limited**;
- There is **many reasons why is like that** and today presentation could not listed all due to the **“luck of time”**;
- More important is to **adopted on the realistic circumstances** and to act in the future based on realistic judgments and proper and realistic actions;

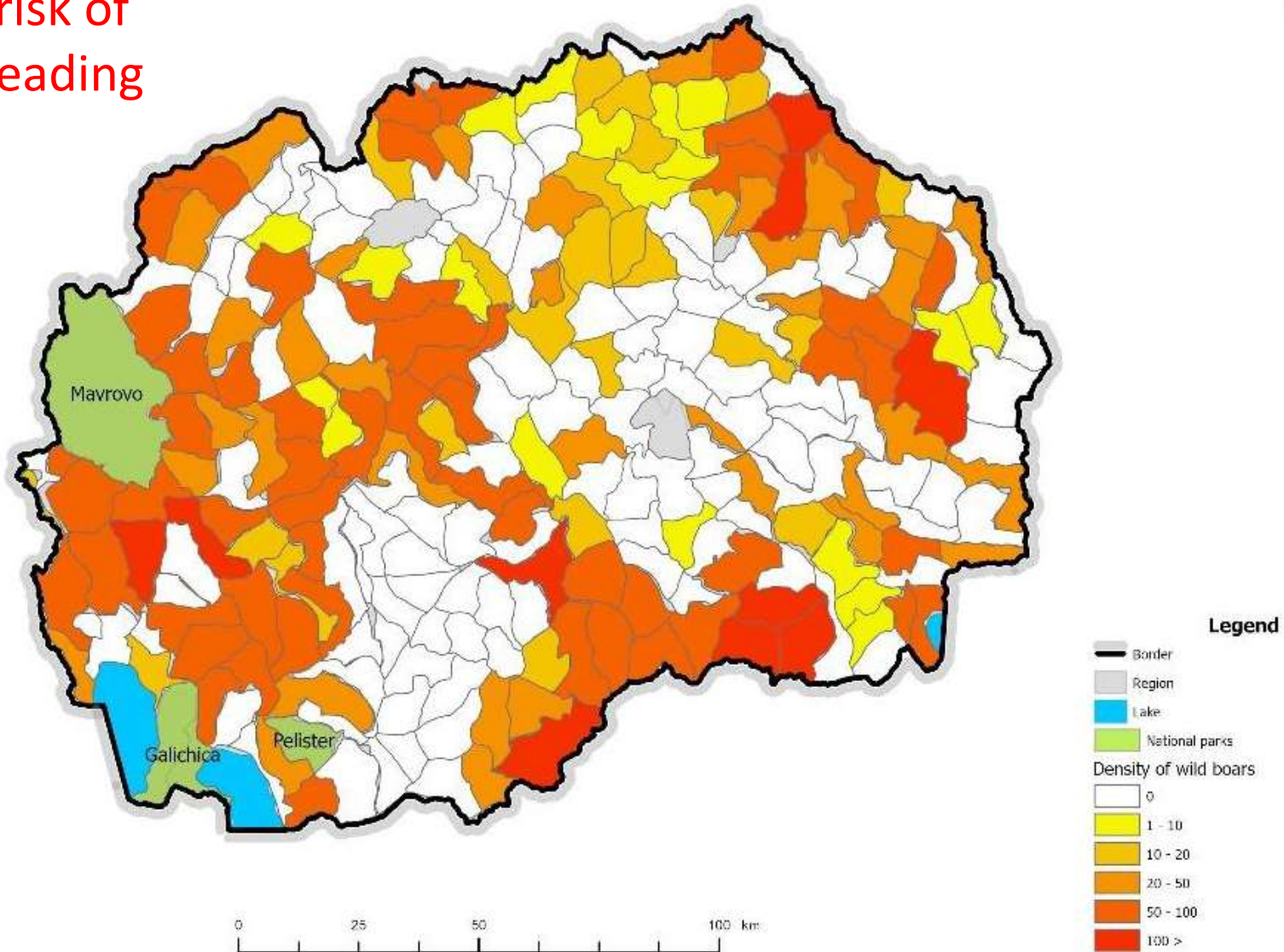
Overview of AFV about risk categorization



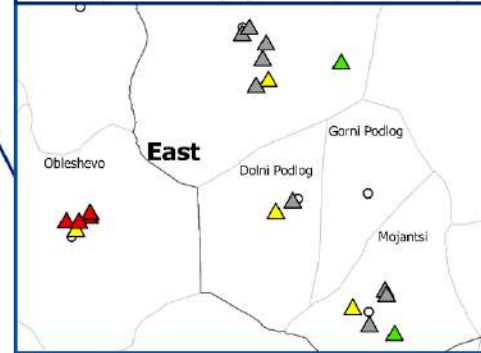
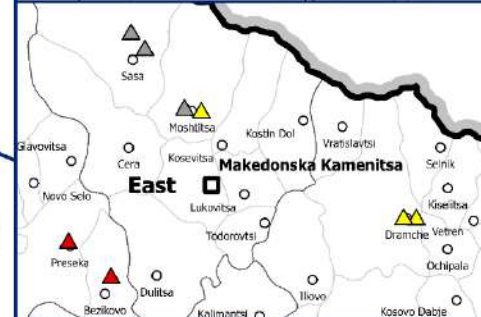
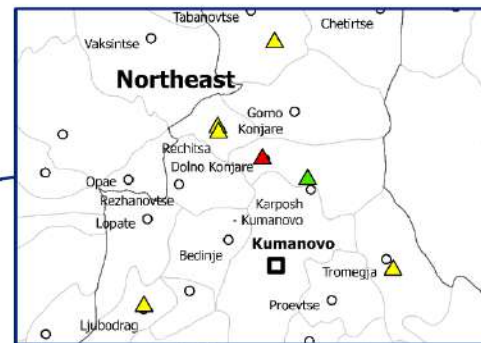
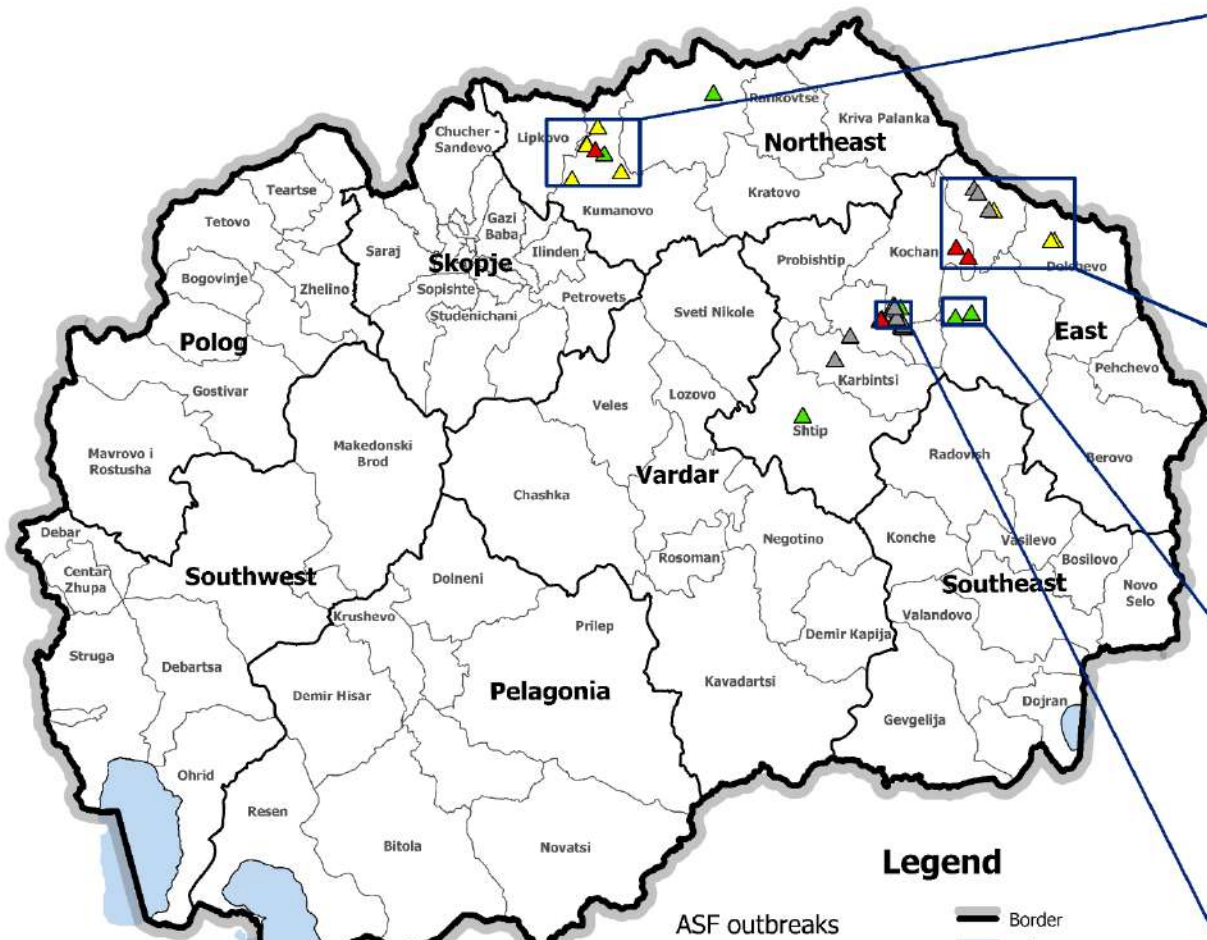
Source: Food and veterinary agency of N. Macedonia (AFV)

Density of wild boars

Major risk of
ASF spreading



ASF OUTBREAKS IN 2022 IN CATEGORIZED AND NON-CATEGORIZED PIG FARMS



- Legend**
- ASF outbreaks categorized pig farms
 - Risk
 - ▲ High
 - ▲ Medium
 - ▲ Low
 - ▲ Non-categorized
 - Border
 - Lake
 - Region
 - Municipality
 - Border of the settlement
 - City
 - Settlement

ASF threat of Macedonian pig husbandry

Прилог 2. Груба проценка од директните економски штети од можната појава и ширење на АСЧ во Р.Македонија

Р.бр	Економска гранка	Ед.	Капацитет	Вработени	Вредност во ЕУР	Штета %	Штета во ЕУР
1	Поледелство	ха	40.000	2.500 бр	€ 20.000.000	30%	€ 6.000.000
2	Свињарство	бр	320.000	3.000 бр	€ 48.000.000	90%	€ 43.200.000
3	Кланична индустрија	бр	320.000	500 бр	€ 6.400.000	90%	€ 5.760.000
4	Месна индустрија - извоз	кг	6.000.000	300 бр	€ 18.000.000	100%	€ 18.000.000
5	Ловен туризам – дива свиња	бр	20.000	100 бр	€ 3.000.000	90%	€ 2.700.000
6	Буџетски расходи по појава на АСЧ	год	1	5.000 бр	€ 100.000.000	100%	€ 100.000.000
					€ 195.400.000		€ 175.660.000

< procenka spored AHV popis Juli 2019 i Izvestaj za maticno knjigovodstvo, selekcija i sledenje na sostojbite vo svinjarstvoto za 2018 (MZSV I FZNH)

< procenka spored podatok od Zavod za statistika na R.Makedonija za 2018

ГРУБА ПРОЦЕНКА НА ДИРЕКТНИТЕ ШТЕТИ ОД ПОЈАВАТА И ШИРЕЊЕТО НА АСЧ – АФРИКАНСКА СВИНСКА ЧУМА ВО НАШАТА ЗЕМЈА ПОКАЖУВА ДЕКА ВРЕДНОСТА НА СЕКТОРОТ Е ВИСОКА РЕЧИСИ 200 МИЛИОНИ ЕВРА,

А МОЖНАТА ДИРЕКТНА ШТЕТА Е ОКОЛУ 170 ДО 180 МИЛИОНИ ЕВРА !

ESTIMATION OF DIRECT DAMAGE OF POSSIBLE ASF NATIONAL MAJOR OUTBREAK IN DOMESTIC AND WILD PIG POPULATION UP TO 200 MILION EUROS

The aim and database ...

The aim of the research was to analyse the key farm results of five biggest Macedonian pig farms.

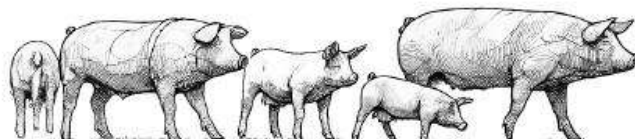
The results of these farms over the course of **one year**, **from start of August 2023 to end of July 2024**, were analysed using the analytical software *MSM - Multi Site Monitor Sows/MyAgrovision.com*

The research sample contains information from **5 commercial farms** for the specified period, based on:
the total number of **sows** (n=5393),
the total number of **services** (n=15041) and
the total number of **farrowing's** (n=12554).



Database based on continued recoding in following farms:

- ✓ **Agria** Agroindustrijska Grupacija – farm Gradsko
- ✓ **Uni Agro** D.O.O. – farm St.Nikole
- ✓ **Vini Farma** DOO – farm Peplane
- ✓ **Z.Z. Edinstvo** – farm Čelopek
- ✓ **Žito Maleš** – farm Smojmirovo



Larger producers – Agria Veles



Size = 2000-2200 sows

From farrowing to finishing

**Danbred satellite nucleus farm
since 2004**



Larger producers – Agria Veles



Larger producers – Agria Veles



Larger producers – UniAgro Sv.Nikola



Size = 800-900 sows

From farrowing to finishing

**Danbred genetic
commercial relationship**



Larger producers – UniAgro Sv.Nikola



Larger producers – UniAgro Sv.Nikola



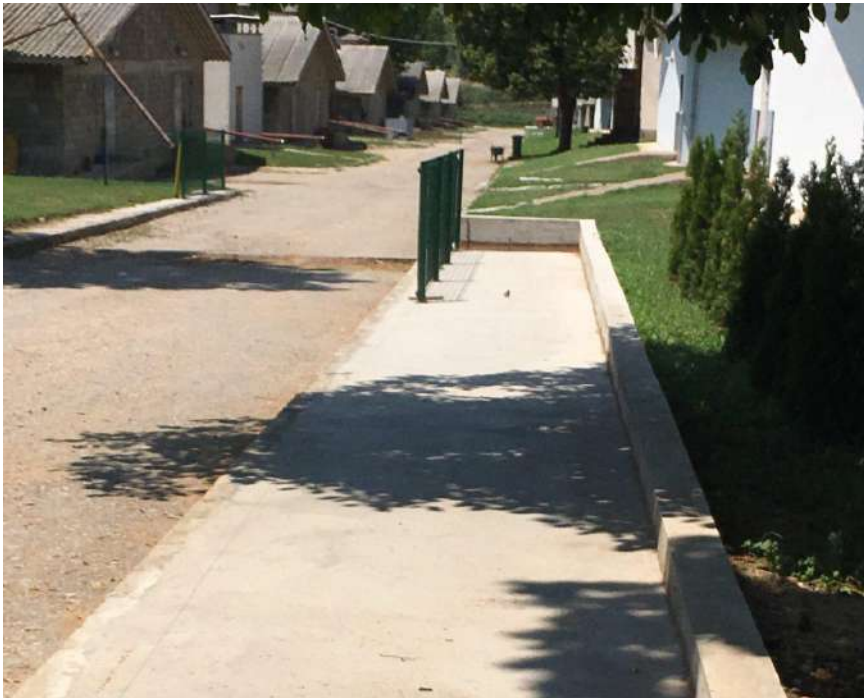
Larger producers – Vini Farma Vinica



Size = 700-750 sows

From farrowing to finishing

**Topigs Norsvin InGene farm
since 2014**



Larger producers – ZZ Edinstvo Tetovo



Size = 900-950 sows

From farrowing to finishing

RA-SE genetic on commercial base

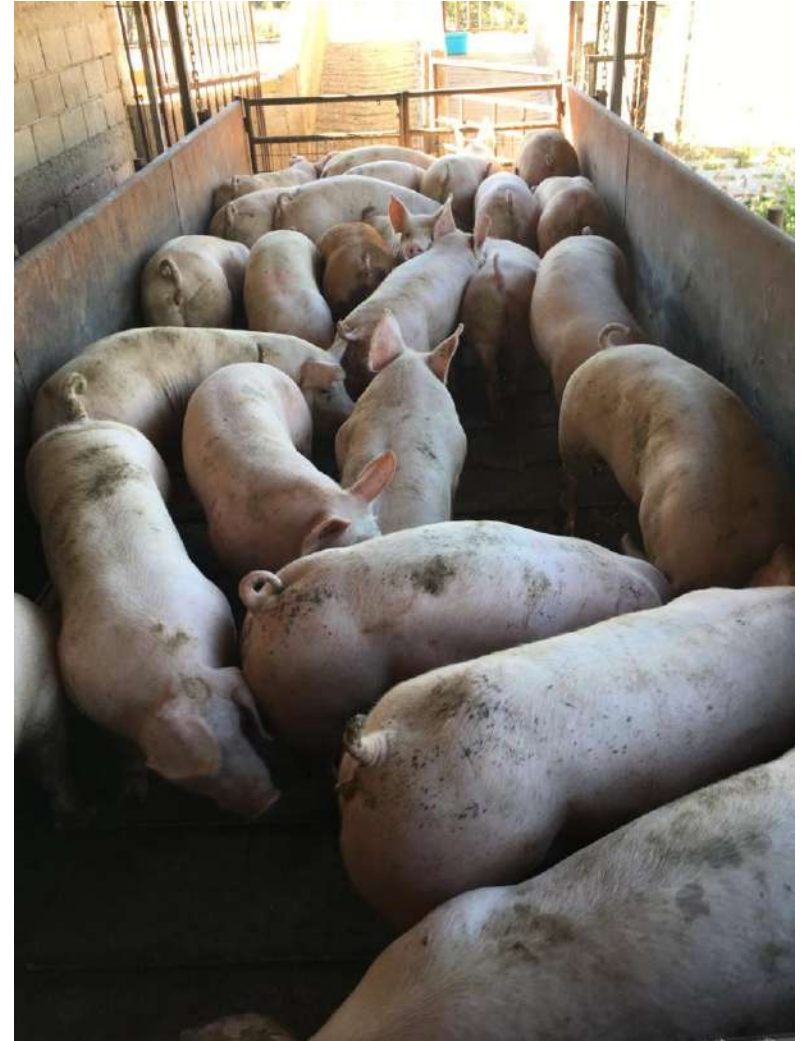
Larger producers – ZZ Edinstvo Tetovo



Larger producers – ZZ Edinstvo Tetovo



Larger producers – Vini Farma Vinica



Larger producers – Žito Malesh Berovo



Size = 700-750 sows

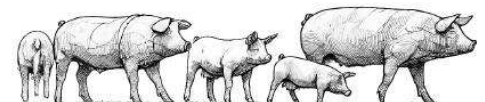
From farrowing to finishing

**Topigs Norsvin InGene Farm
since 2001**

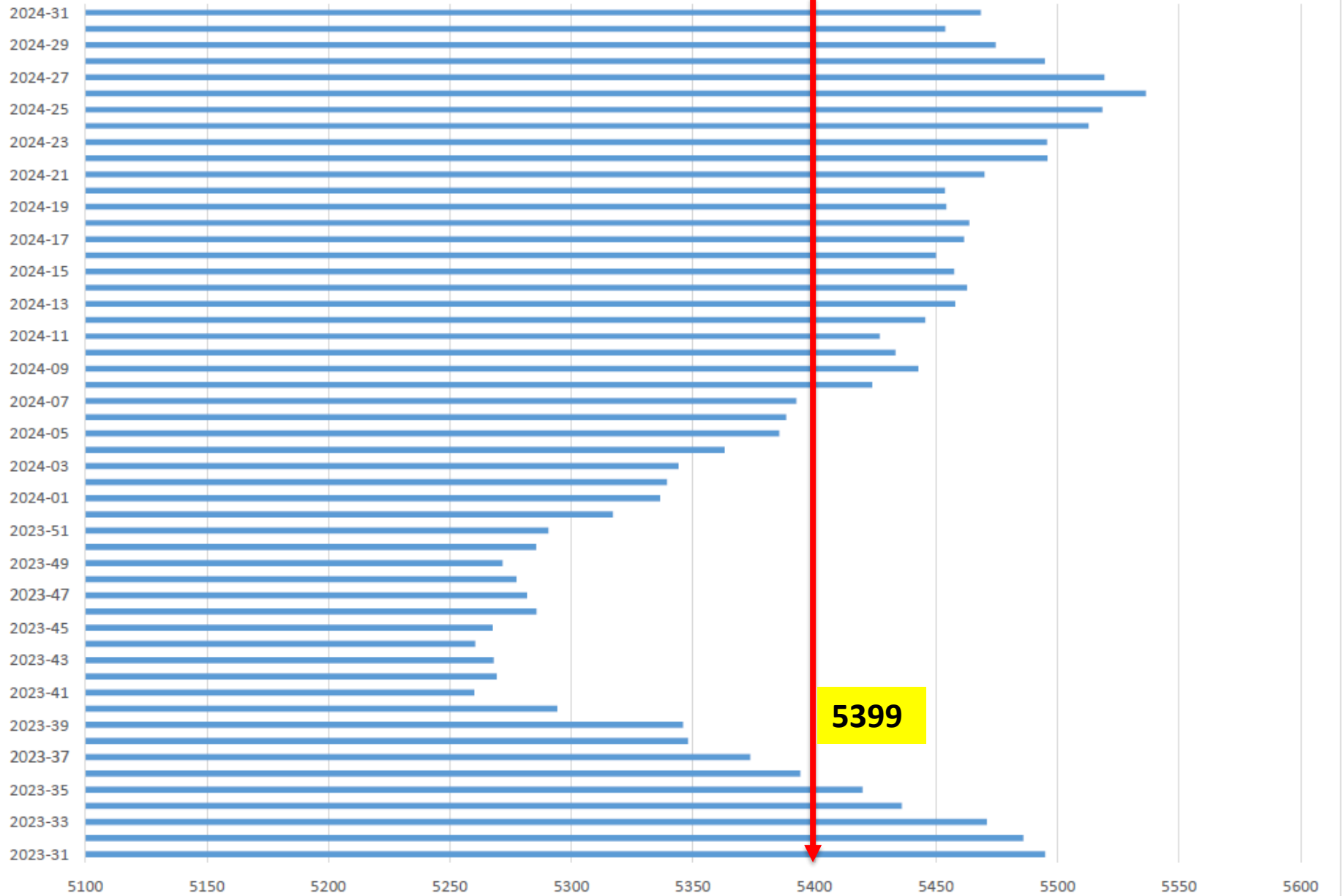
Key farm results collected:

The examination involved calculating numerous farm results, such as:

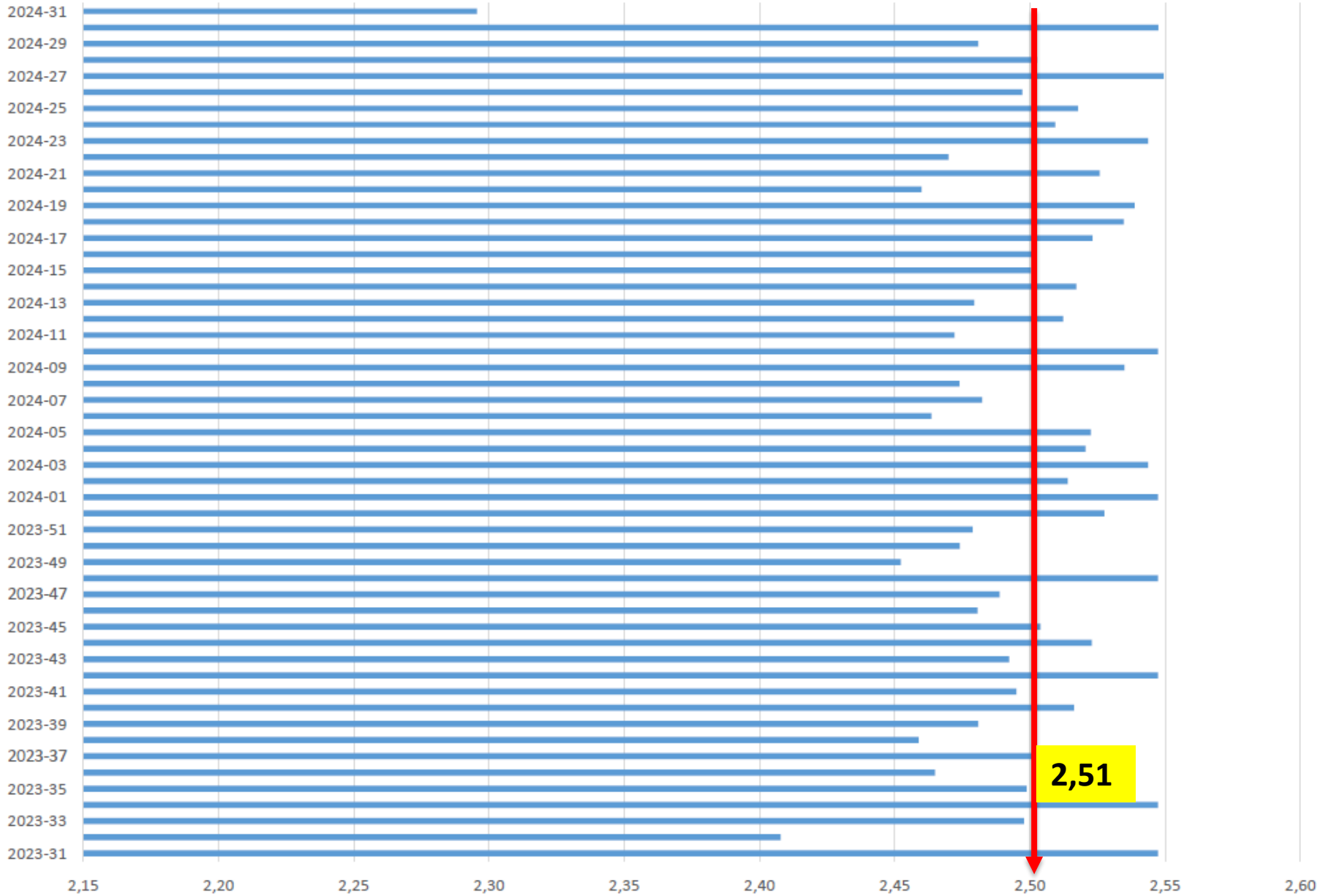
- ✓ *litters/sow/year,*
- ✓ *weaned/sow/year,*
- ✓ *age of gilts at first service,*
- ✓ *number of inseminations,*
- ✓ *inseminations per week,*
- ✓ *period from weaning to first insemination,*
- ✓ *re-insemination rate (%),*
- ✓ *farrowed gilts (%),*
- ✓ *gestation days/litter,*
- ✓ *number of farrowing's,*
- ✓ *farrowing rate %, total born/litter of gilts,*
- ✓ *total born/litter including mummified,*
- ✓ *live-born/litter, stillborn/litter,*
- ✓ *lactation days/litter,*
- ✓ *pre-weaning mortality rate %,*
- ✓ *weaned/litter,*
- ✓ *individual piglet weight at weaning (kg),*
- ✓ *non-productive days/litter and*
- ✓ *sow mortality rate (%).*



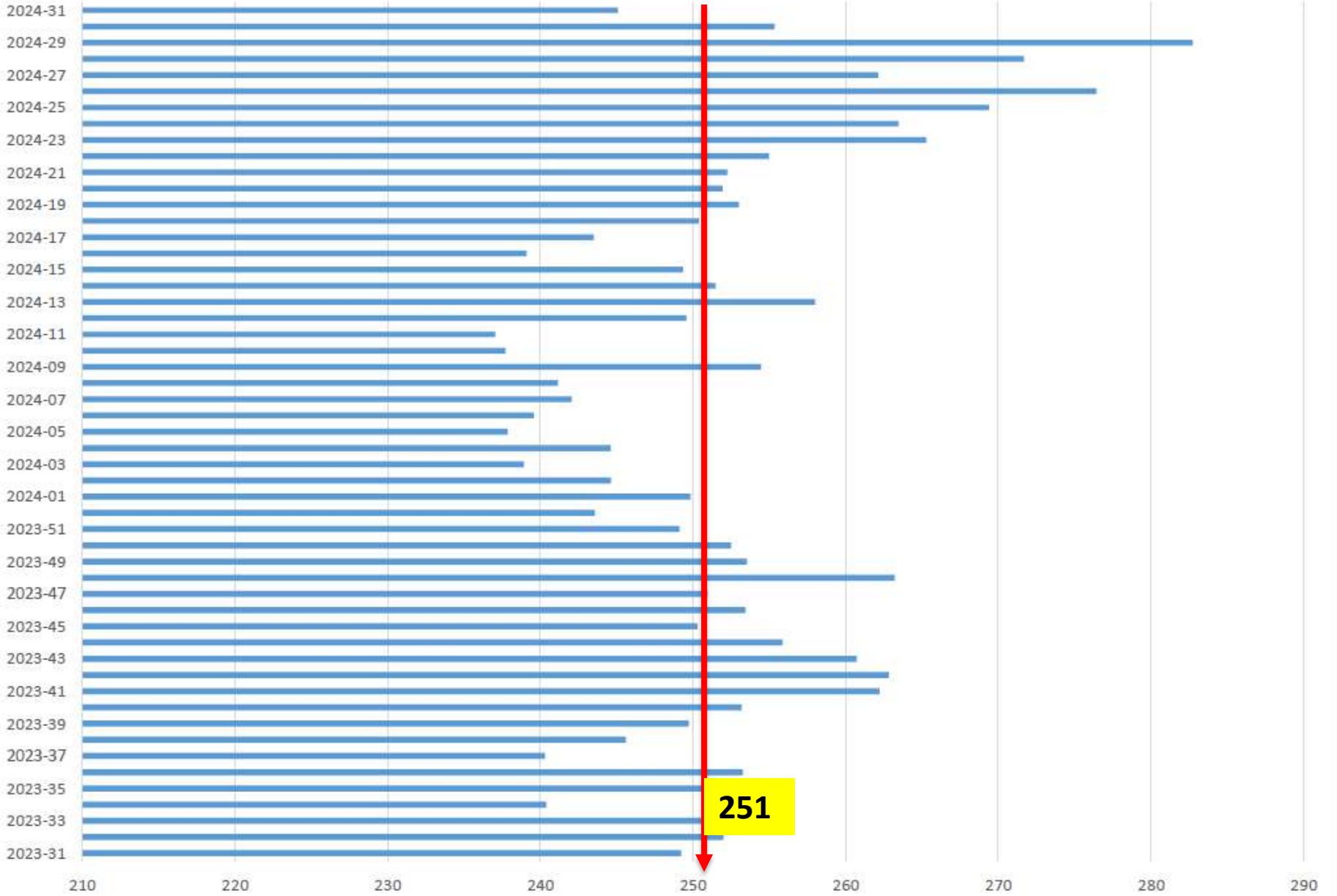
Sows / Year (No)



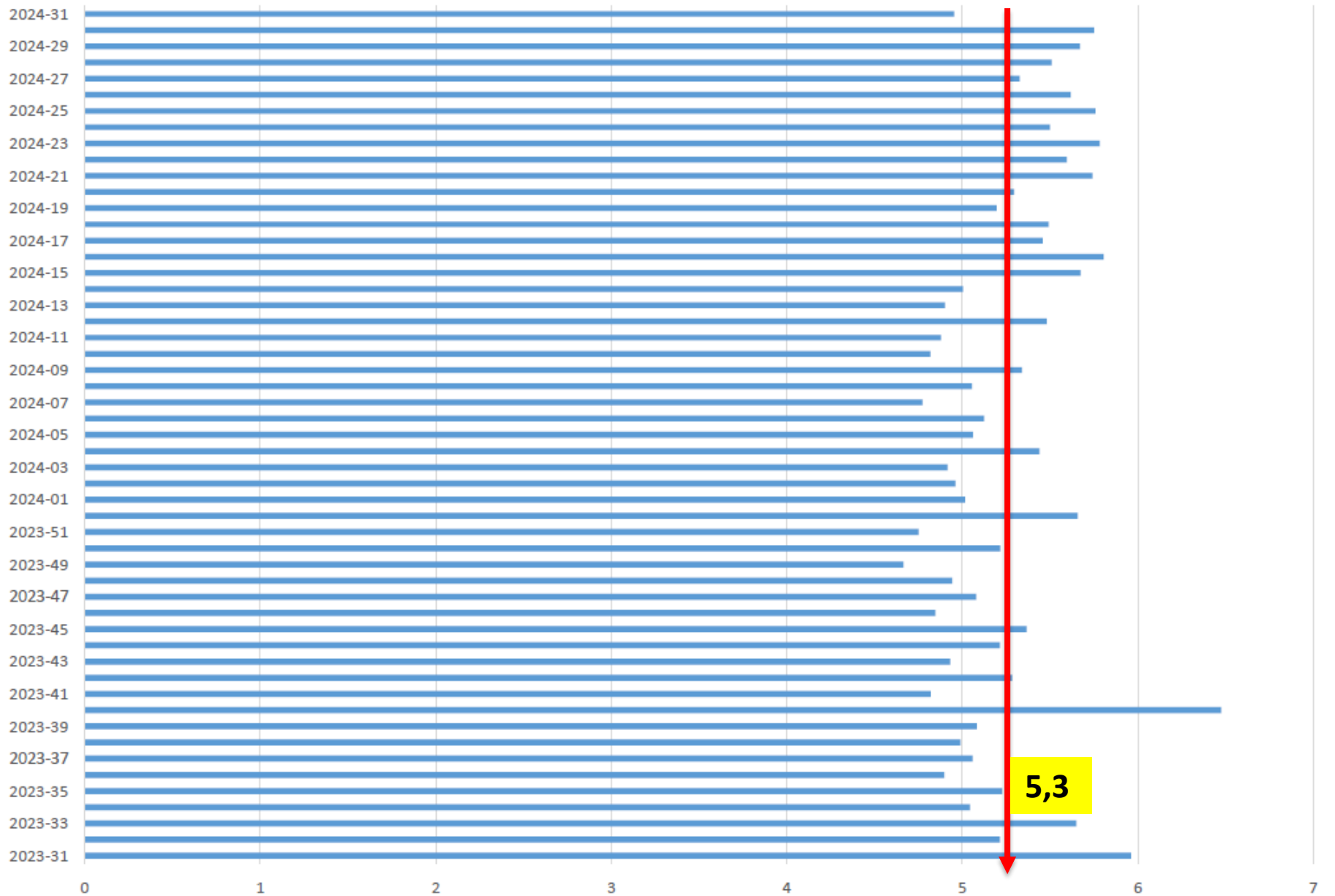
Litters / sow / year



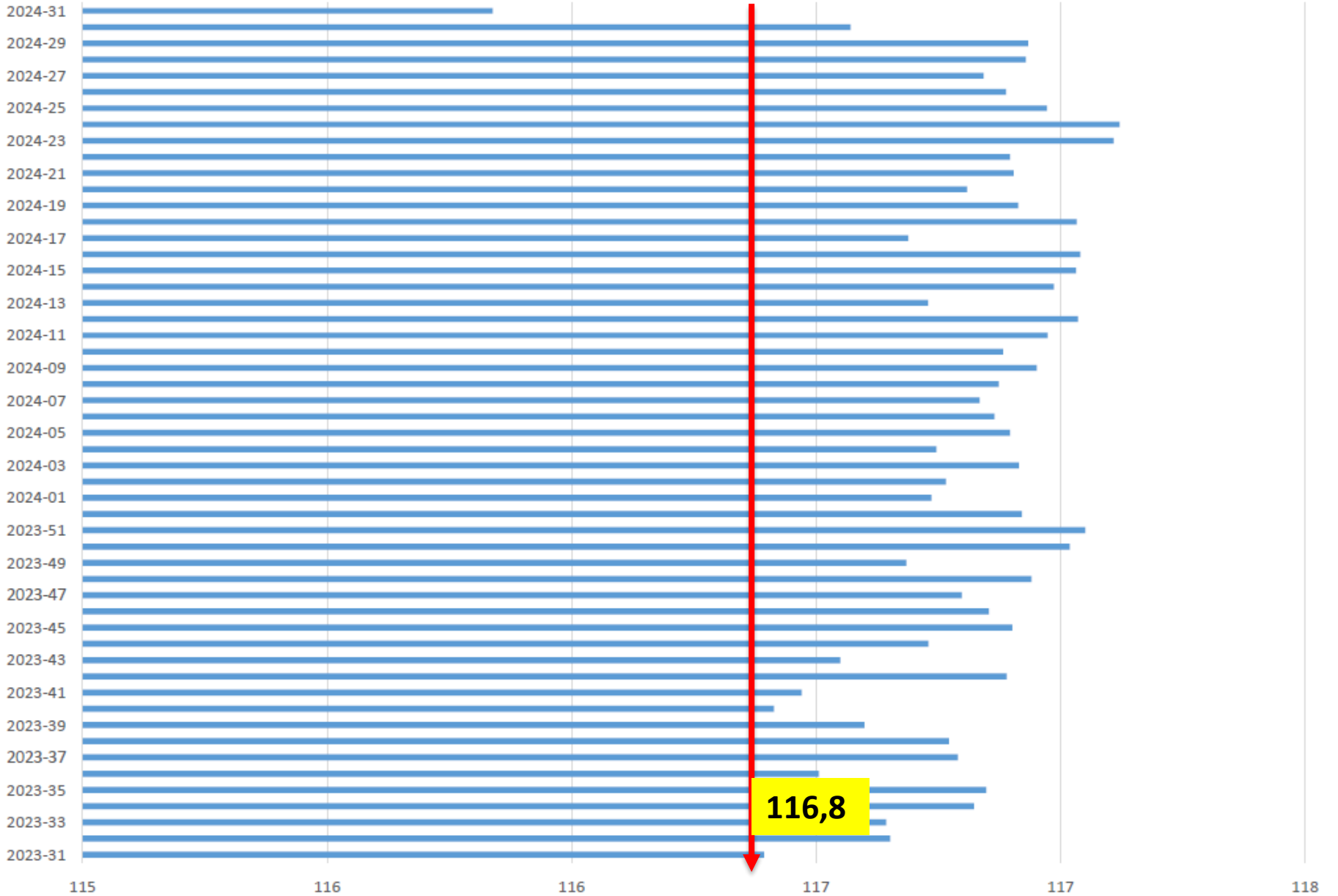
Served gilts age



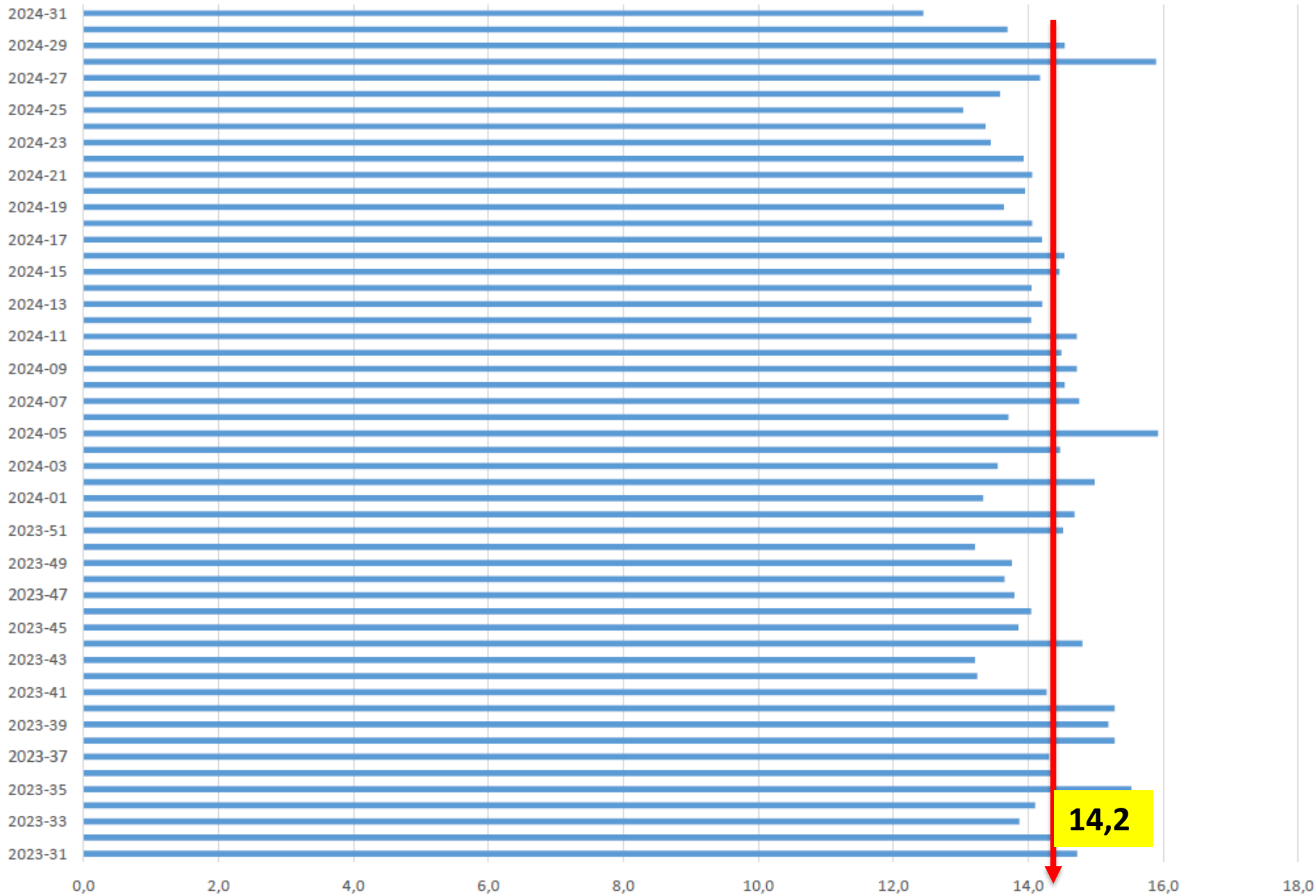
Int. weaning - 1st serv.



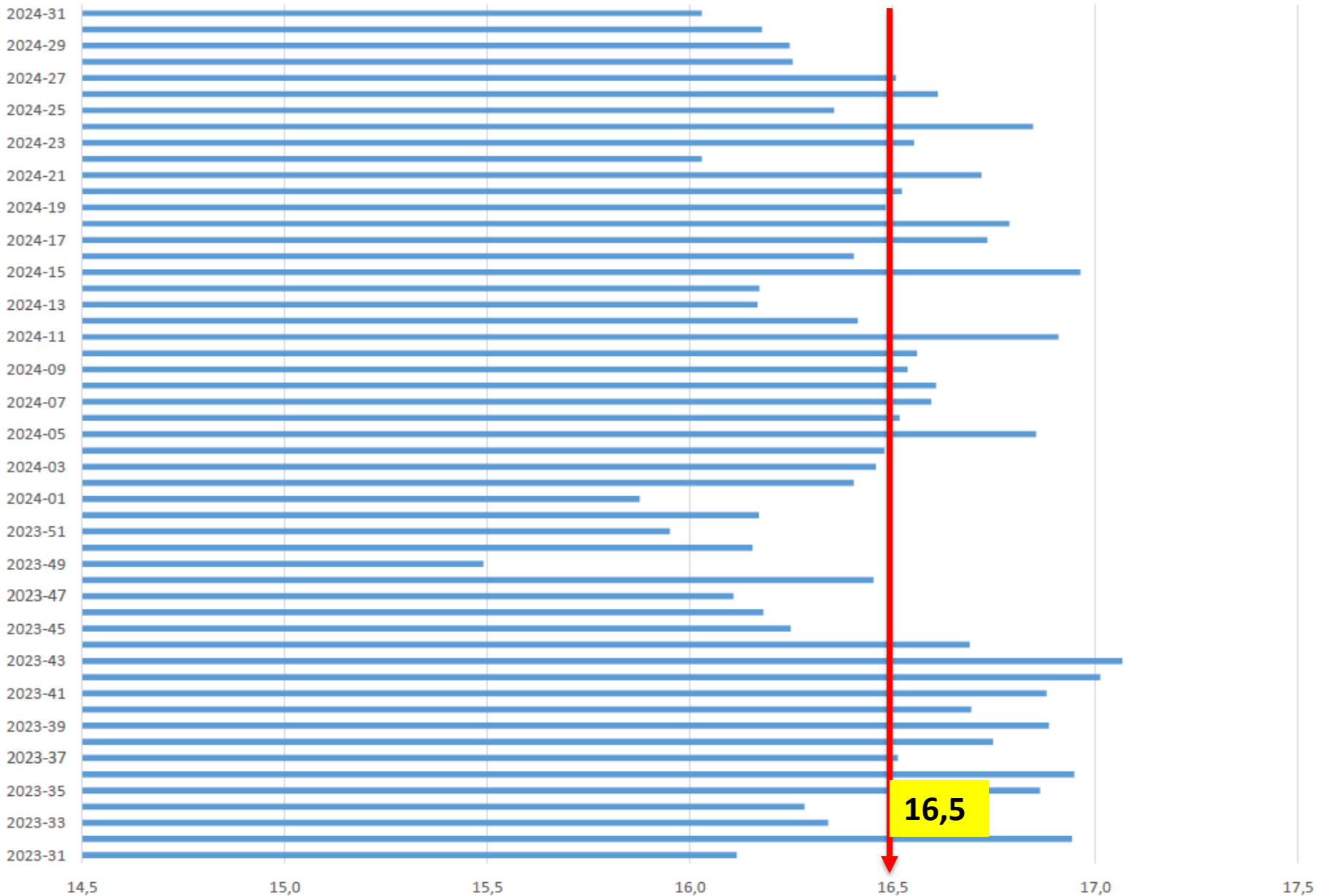
Pregnancy days / litter (Days)



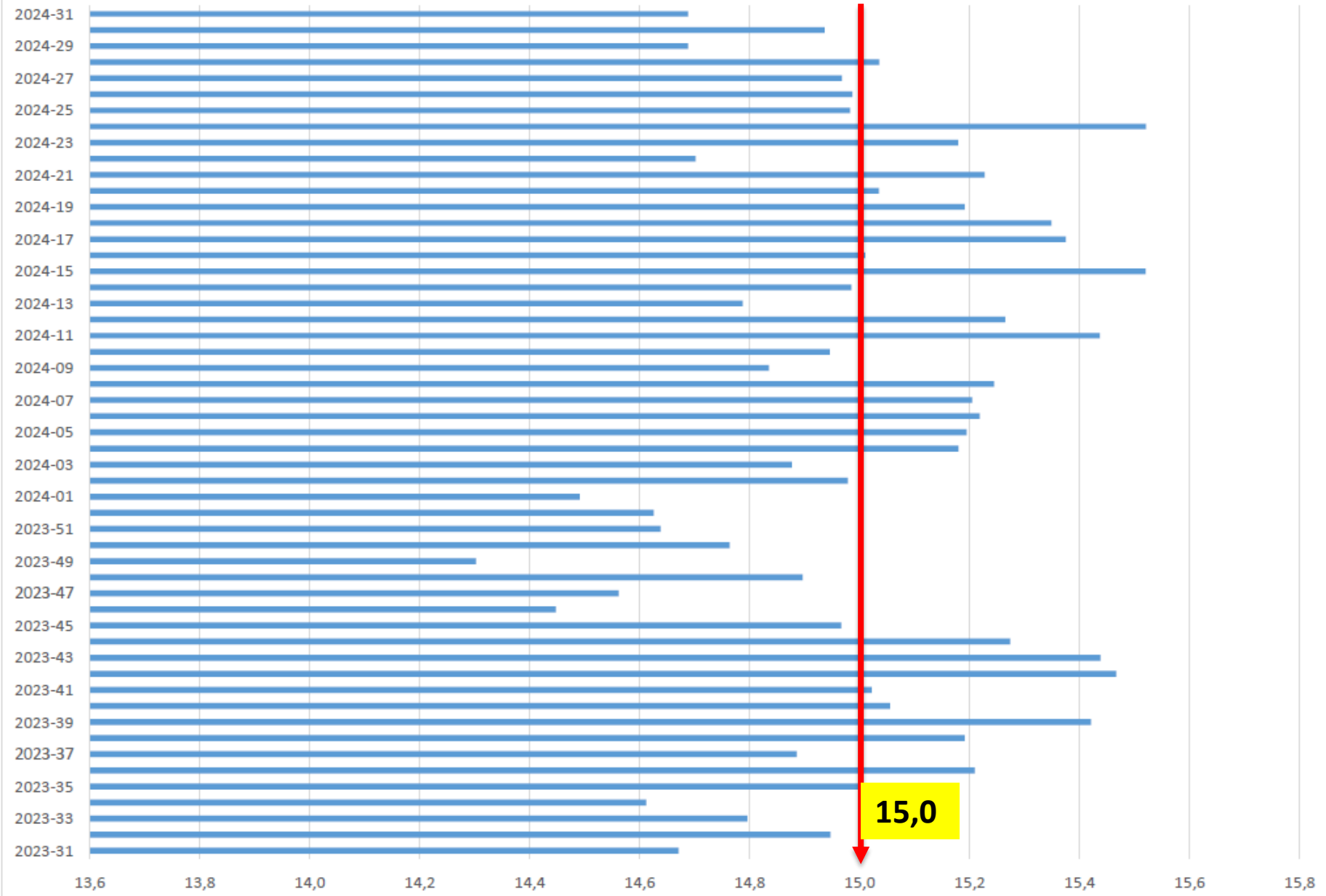
Total born / litter gilts



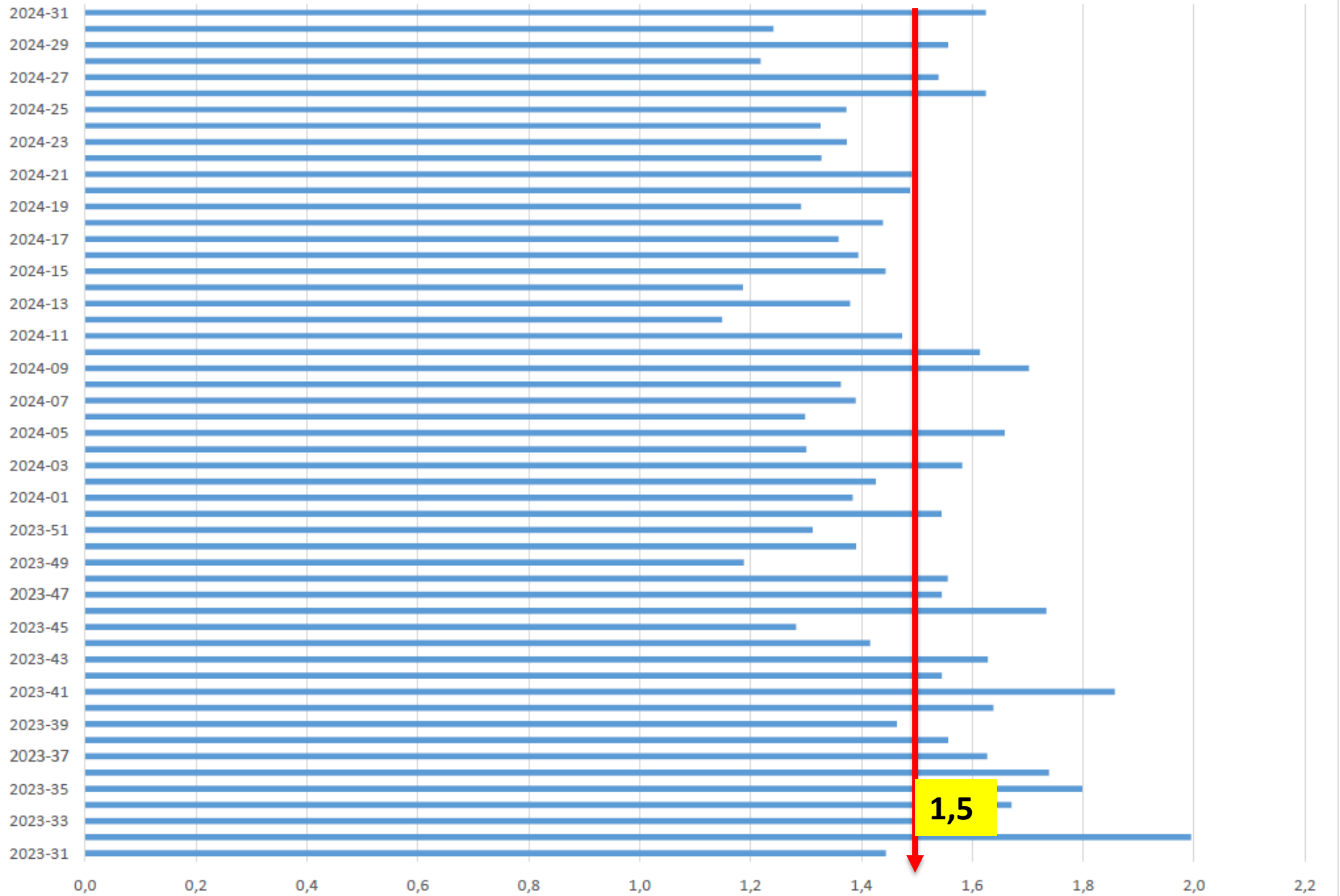
Total born / litter excl. Mumm



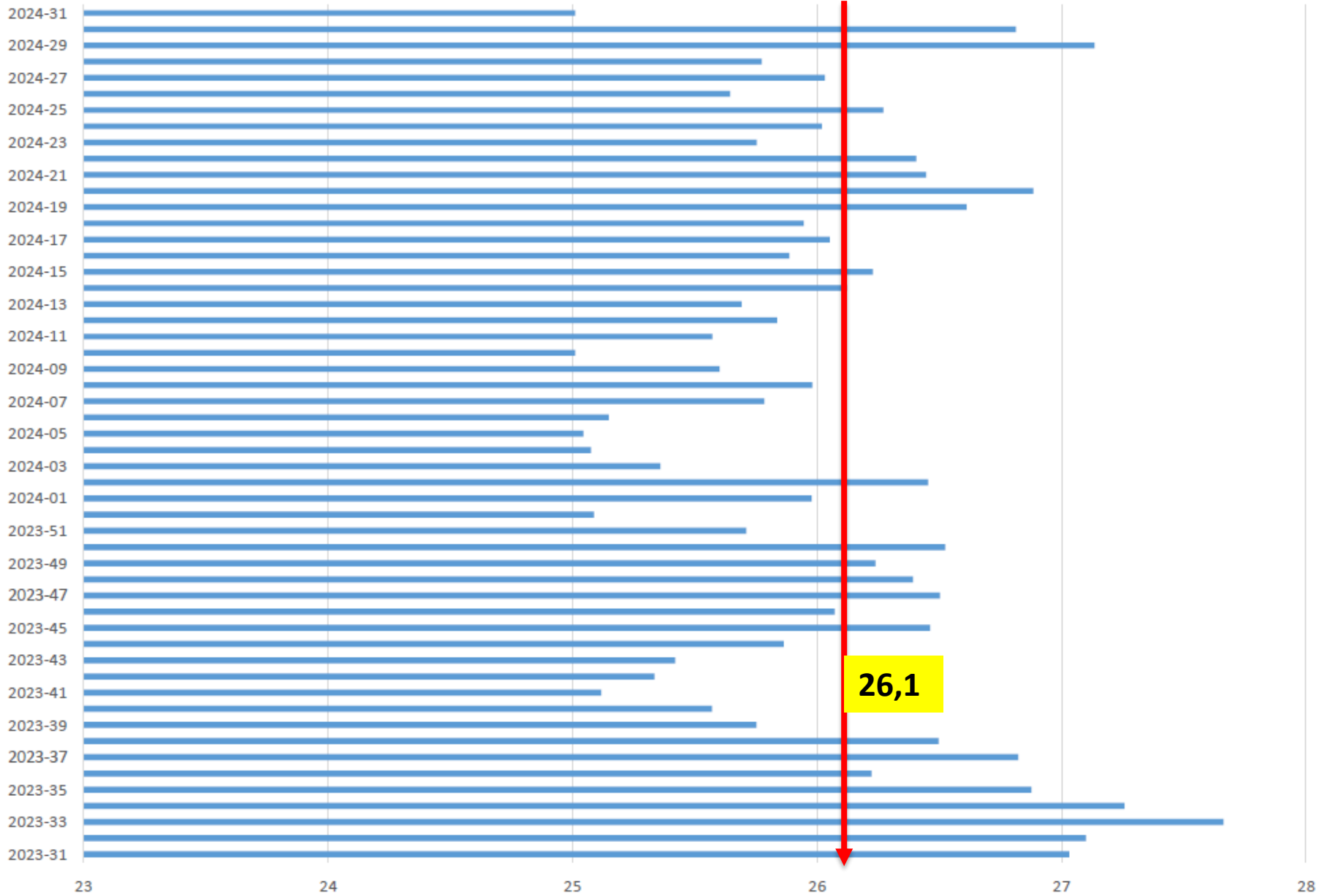
Live born / litter



Stillborn / litter

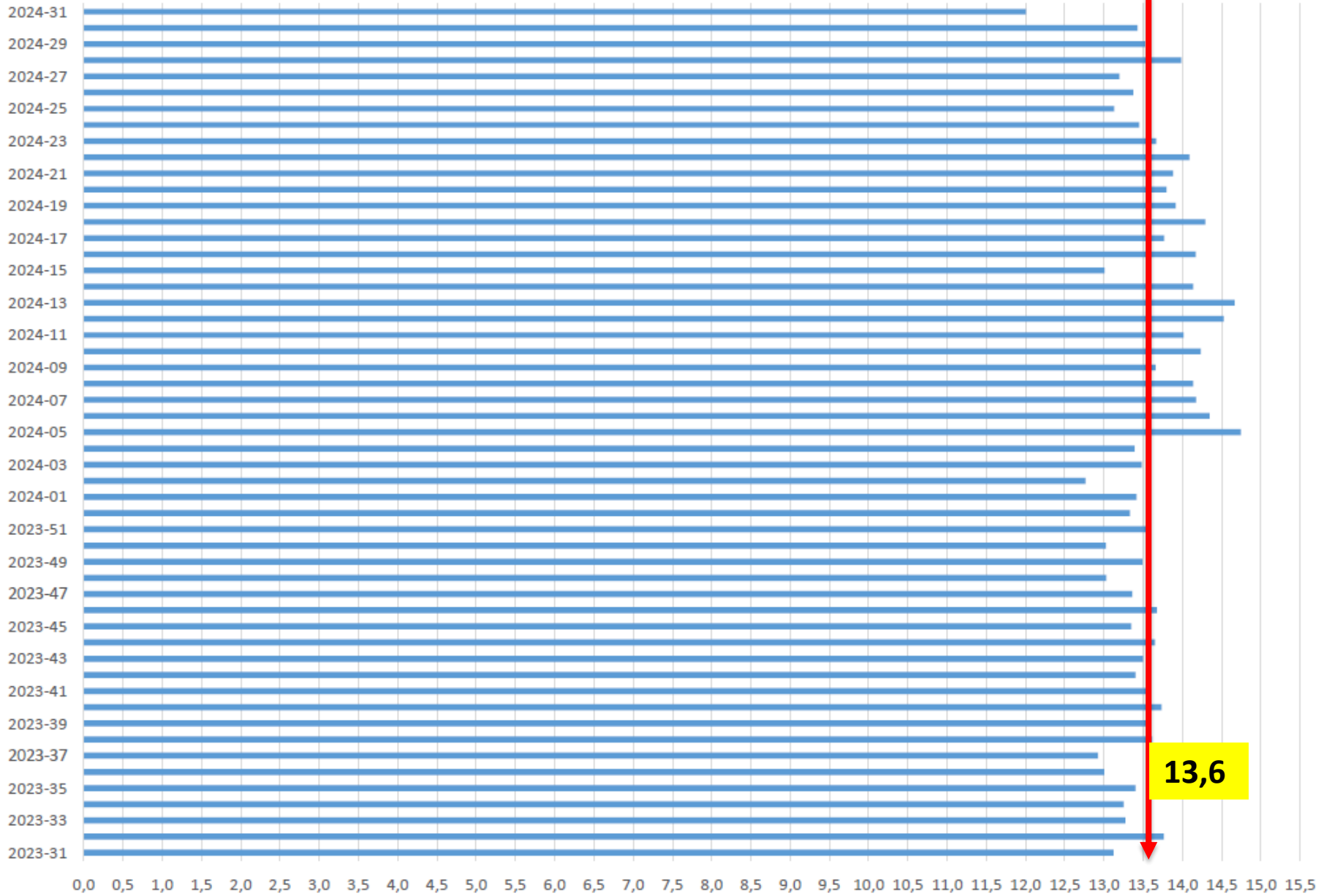


Lactation days / litter

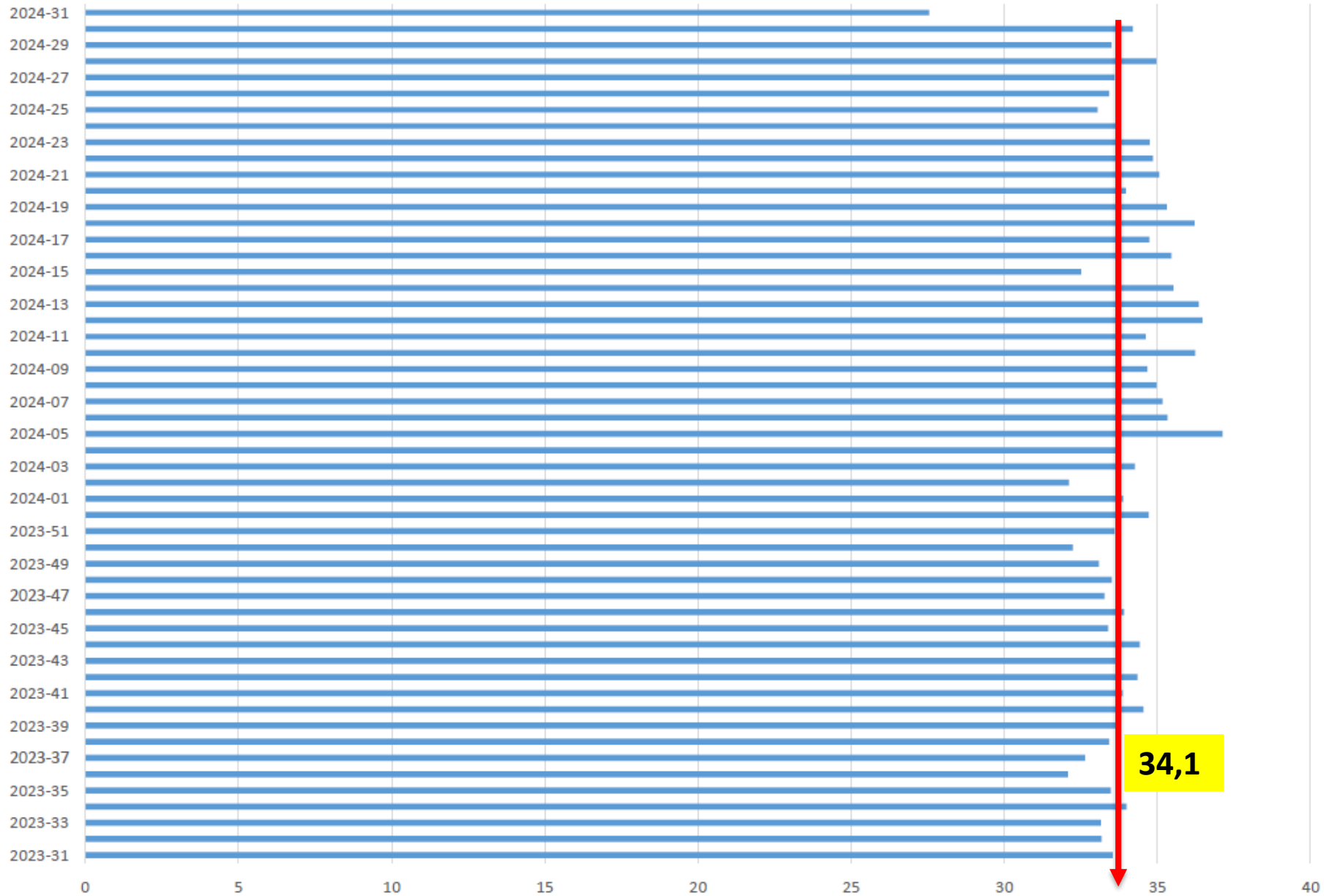


26,1

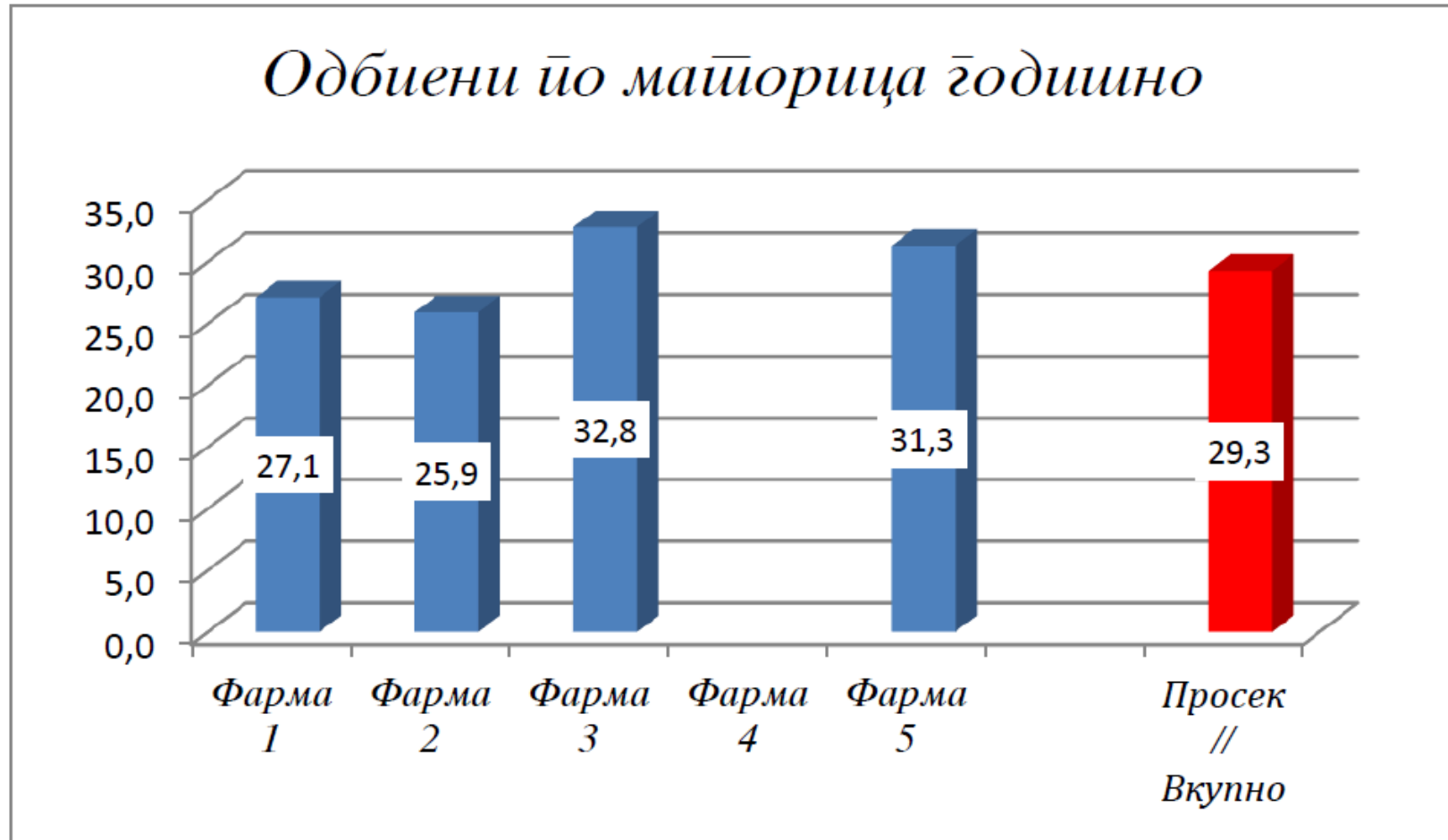
Weaned / litter



Weaned / sow / year

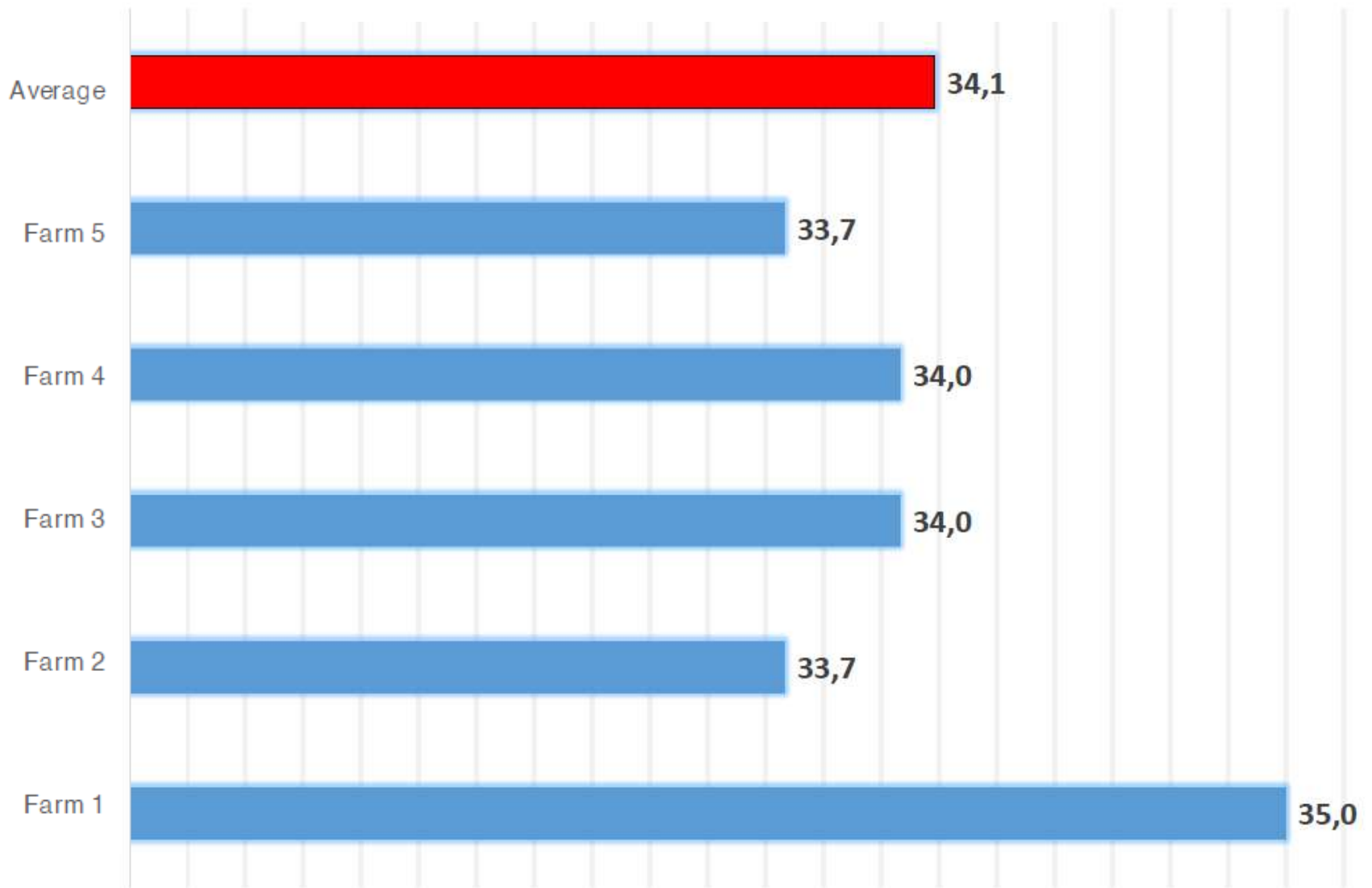


Weaned per sow per litter 2018



Графикон 23. Одбиени прасиња по маторица годишно кај фармите во 2018

Weaned piglets / Sow / Year in N.Macedonia from year 2023 to 2024



W/S/Y

The number of **w/s/y** as one of the **key indicators** of the pig production, continues to show a strong positive trend and an indirect expression of the overall improvements in the sector.

If we compare the results from 2018 previously published, when the level of production was:

weaned piglets per sow per year (w/s/y) **29.3**, we can observe an annual average improvement of **0,82 w/s/y** until 2024.

SOWS – Technical from Multi Site Reporting (MSR)
01. FARM SIZE (Sows present)

			261	394	546	>=819
	Ave.	<=260	393	545	818	
Number of farms	535	113	109	111	103	99
Ave. no. sows present	574,0	174,0	321,0	471,7	669,6	1324,0
Ave. no. gilts present	99,6	28,6	52,3	77,7	117,0	238,5
Litters farrowed / MBF / yr	2,31	2,24	2,30	2,34	2,35	2,34
Weaned pigs / MBF / yr	31,2	28,8	30,8	31,8	32,5	32,4
Breeding female culling rate	36%	36%	35%	33%	37%	36%
Sow mortality / year	7%	7%	7%	7%	7%	9%
Non productive days/sow culled	35,6	43,3	37,9	34,0	30,3	31,6
% Repeat services	8%	9%	8%	7%	7%	8%



Comparison of similar size MKD and EU pig farms key performances for year 2023/2024

Pig farm no	Sows / Year (No)	Litters / sow / year	Total born / litter excl. Mumm	Live born / litter	Stillborn / litter	Pre-weaning mortality % (calc)	Weaned / litter	Weaned / sow / year
1	2002	2,52	17,0	15,6	1,4	10,8%	13,9	35,0
2	939	2,49	18,6	15,8	2,7	14,5%	13,5	33,7
3	785	2,49	15,2	14,4	0,8	5,4%	13,7	34,0
4	937	2,54	15,6	14,7	0,9	8,9%	13,4	34,0
5	737	2,49	16,1	14,6	1,6	7,0%	13,6	33,7
MKD referent values	1080	2,51	16,5	15,0	1,5	9,3%	13,6	34,1
EU referent values - BENCHMARK PIGS NL	> 820	2,34	17,3	15,9	1,4	13,0%	13,8	32,4
Difference MKD - EU		0,17	-0,8	-0,9	0,1	-3,7	-0,2	1,7

Breeding effects in Republic of N.Macedonia (1999 – 2024)

PERFORMANCE	1999	2010	2011	2012	2013	2014	2015	2016	2017	2018	2024	2024-1999	2024-2014
Litters/sow/year	2,20	2,30	2,33	2,30	2,19	2,37	2,32	2,36	2,37	2,38	2,51	0,31	0,14
Live born piglets per litter	9,0	11,0	11,2	11,3	11,4	12,5	13,0	13,2	13,4	13,8	15,0	6,0	2,5
Weaned piglets per litter	7,9	9,5	9,9	10,0	10,0	11,3	11,4	11,7	12,0	12,3	13,6	5,7	2,3
Lactation length	26,0	26,8	27,2	27,0	26,6	26,6	27,3	26,3	27,8	26,0	26,1	0,1	-0,5

Conclusions

- ✓ Macedonian pig husbandry have **continued improvement** pattern since 1999;
- ✓ The **larger farms are leading the sector** and observed advance key farm results are expressing **stability of ongoing one week management system**;
- ✓ We observe an annual average improvement of **0,82 w/s/y**
- ✓ The average of key farm performance **w/s/y** of similar by size farms in EU and MKD farms define difference of **1,4 w/s/y in favor** of Macedonian farms.
- ✓ **Efficiency of production** per sow / farm is significantly increased;

Conclusions

- ✓ The **main risk in the next years** for the further development is possible risk of major outbreak(s) of **ASF**;
- ✓ Pig husbandry of our country **is highly potential livestock sub-sector and can keep the developments in the coming years**;
- ✓ **Substitution of imported frozen and fresh pork** in the first phase **of 20-30%**. This can be done with same or similar resources of the sector via heavy finishers behind bacon type of production;
- ✓ **Importance of biosecurity** for the future of Macedonian pig husbandry is very high and must be included in the primer priorities for all stakeholders.



Универзитет “Кирил и Методиј” (УКИМ),
Факултет за земјоделски науки и храна – Скопје (ФЗНХ),
Институт за биотехнологија (ИАБ)
Катедра за сточарство – Оддел за свињарство



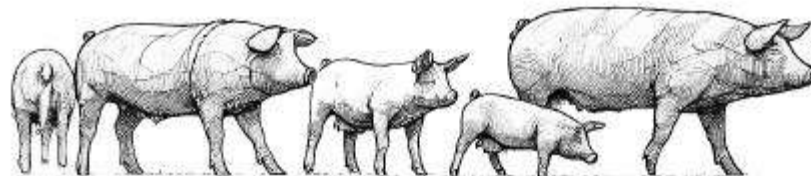
Pig production in North Macedonia and importance of biosecurity in the country

Vuković V. ¹, Andonov S. ^{1,2} and Simović M. ³

*University of St. Cyril and Methodius" - Faculty of agricultural Sciences and Food Skopje,
Republic of North Macedonia¹*

Swedish Agriculture University - SLU ²

³ Food and Veterinary Agency, North Macedonia



BETTER COST Meeting 4-5 February, 2025 – Skopje, Macedonia