Antibiotic Usage Report

Introduction

The Soil Association has always led the way in advocating prudent use of antibiotics, banning routine use and setting high standards of welfare and husbandry to prevent diseases which might require treatment. In recent years, the livestock farming sector as a whole has made huge improvements in this area, showing a 48% reduction in tonnes sold in 2019 compared with 2014 (UK Veterinary Antimicrobial Resistance and Sales Surveillance (VARSS), 2020). Retailers have also started to lead the way in pushing their producers to adopt husbandry methods which use much less antibiotic. For the Soil Association to remain at the forefront of advocating farming methods with the lowest levels of antibiotic usage it was necessary to collect data from licensees across different livestock sectors to try and obtain accurate data on usage. As this data has not previously been collected, it was decided to request licensees to consent for their veterinary practices to provide details of antibiotic purchases to the Soil Association and The George Farm Vets who would process the data. It was hoped that this convenience sample would be representative of Soil Association farms, and to provide a baseline from which to measure usage with ongoing data collection as part of annual certification. The Alliance to Save Our Antibiotics supported this work, as no accurate data specific to organic farms across different livestock sectors was currently available and it is hoped that lessons for the wider industry can be learned from the lowest users of antimicrobials.

Method

A data consent form was sent out to licensees, asking them to consent for their vet to provide details of all antibiotics sold or prescribed between 1/6/18 and 31/5/19. Also, livestock figures for the same period were requested in the following format:

Dairy

Adult dairy cows, dairy youngstock 0-1 year, dairy youngstock 1-2 years

Beef

Adult beef cows, beef youngstock 0-1 year, beef youngstock 1-2 years

Sheep

Breeding ewes, lambs slaughtered or sold

Antibiotic Usage Report

Pigs

Boars and sows, slaughter pigs sold, weaned pigs sold, weaned pigs purchased

Broilers

Broilers or turkeys sent to slaughter

Layers

Laying hens (average figure)

The relevant veterinary practices were contacted by email with a background to the project, copies of the consent forms and a request to provide the antibiotic sales data, separated by species where possible. The quality of data provided was hugely variable, with some practice management systems providing detailed accurate information by species, and some where the information had to be extracted as best as possible from the medical history. Where multiple species were present on farm and it was not clear from the vet practice data which animals had been treated with which antibiotic then the farmer was contacted by The George Farm Vets to try and ascertain from their own records how the medicines had been used. 211 viable datasets were collected from the 248 returned consent forms. In some cases, it was not possible to obtain the information from the vets despite multiple attempts by phone and email, in others the consent form was incorrectly filled out and details could not be obtained from the licensee. In one case consent was withdrawn by the licensee.

For dairy, beef and sheep the relevant AHDB/University of Nottingham antibiotic calculator was used to generate figures for milligrams per population corrected unit (mg/PCU and Defined Course Doses (DCDVet). For pigs and broilers, the guidance document from the Veterinary Medicines Directorate 'Understanding the Population Corrected Unit used to calculate antibiotic use in food producing animals (2016)' was used to calculate the eligible weight of livestock. Laying hens are not included in this, but as only one producer used any antibiotic then the specific use is stated. A peculiarity of the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) PCU system is that cattle are only eligible if present on farm as an adult dairy cow, or if they are slaughtered, purchased or sold. On many beef farms, the livestock weight present on farm vastly exceeds the numbers qualifying for the PCU. This is especially the case in suckler herds, where the breeding cows and retained calves are not counted. On some farms it was clear from the livestock figures that in some cases, for example conservation grazing where breeding efficiency may not be a priority, there were substantially more adult cows present than the number of calves produced each year. This discrepancy was discussed with the author of the University of Nottingham calculator Robert Hyde. Although the Cattle Health and Welfare Group (CHAWG) have yet to finalise their preferred methodology for calculating antibiotic use in beef, Dr Hyde

Antibiotic Usage Report

thought that use of the livestock numbers present on farm was reasonable, using an average weight of 200kg for cattle 0-1 years and 425kg for cattle 1-2 years and adults. We have therefore presented the beef data using this method (Method 1) and also using the ESVAC PCU method (Method 2). As the data collection form did not request information on cattle sold or slaughtered, this number has in most cases been estimated from the livestock figures. For example, a herd with 50 adult beef cows, 50 cattle 0-1 year and 50 cattle 1-2 years is clearly retaining all their calves 0-1 year old, and all the animals reaching 2 years old will either be sold, slaughtered or if retained will replace a slaughtered cow (attributed the same weight by ESVAC). The PCU for that farm has therefore been estimated as 50 x 425kg. For farms where only adults and calves 0-1 year are present, then it is presumed all those calves are sold, so the PCU is estimated as the numbers of calves multiplied by 140kg. For farms where the system was unclear from the livestock numbers then the George Farm Vets attempted to contact the farmer for accurate details of animals sold or slaughtered. With the figures for this method being estimates, the reliability is lower, but obtaining accurate figures for cattle slaughtered or sold as a separate enquiry from the original questionnaire proved impossible with a low response rate from farmers. The data is still presented using this method to enable comparison with ESVAC figures, and in most cases will be reasonably accurate. An example of the data produced by the calculator is shown below in Figure 1:

	TOTAL	Critical
Total mg/PCU in herd	7.03	0.00
Total DDD	0.96	0.00
Total DCD	0.29	0.00

Route	Product	Amount used	Units	mg/PCU	Critically important?
Injectable	Apotil 300 mg/ml Solution for Injection	40.00	ml	0.53	
Injectable	Alamycin LA 200mg/ml Solution for Injection	300.00	ml	2.65	
Injectable	Betamox 150mg/ml Suspension for Injection	60.00	ml	0.40	
Lactatingtube	Tetra-Delta Intramammary Suspension	4.00	Tubes	0.06	
Injectable	Pen & Strep Suspension For Injection	200.00	ml	3.29	
Injectable	Engemycin 10 % (DD) Solution for injection	20.00	ml	0.09	

Figure 1: Example of AHDB/University of Nottingham Calculator data

Antibiotic Usage Report

Results

A total of 211 farms contributed data for this report. 57 farms reported having dairy cattle, 119 had beef cattle, 93 had sheep, 18 had pigs, 14 had 50 or more laying hens, 6 had 40 or more broilers and 1 had turkeys. The total numbers of livestock which were covered by this survey are shown below in figure 2:

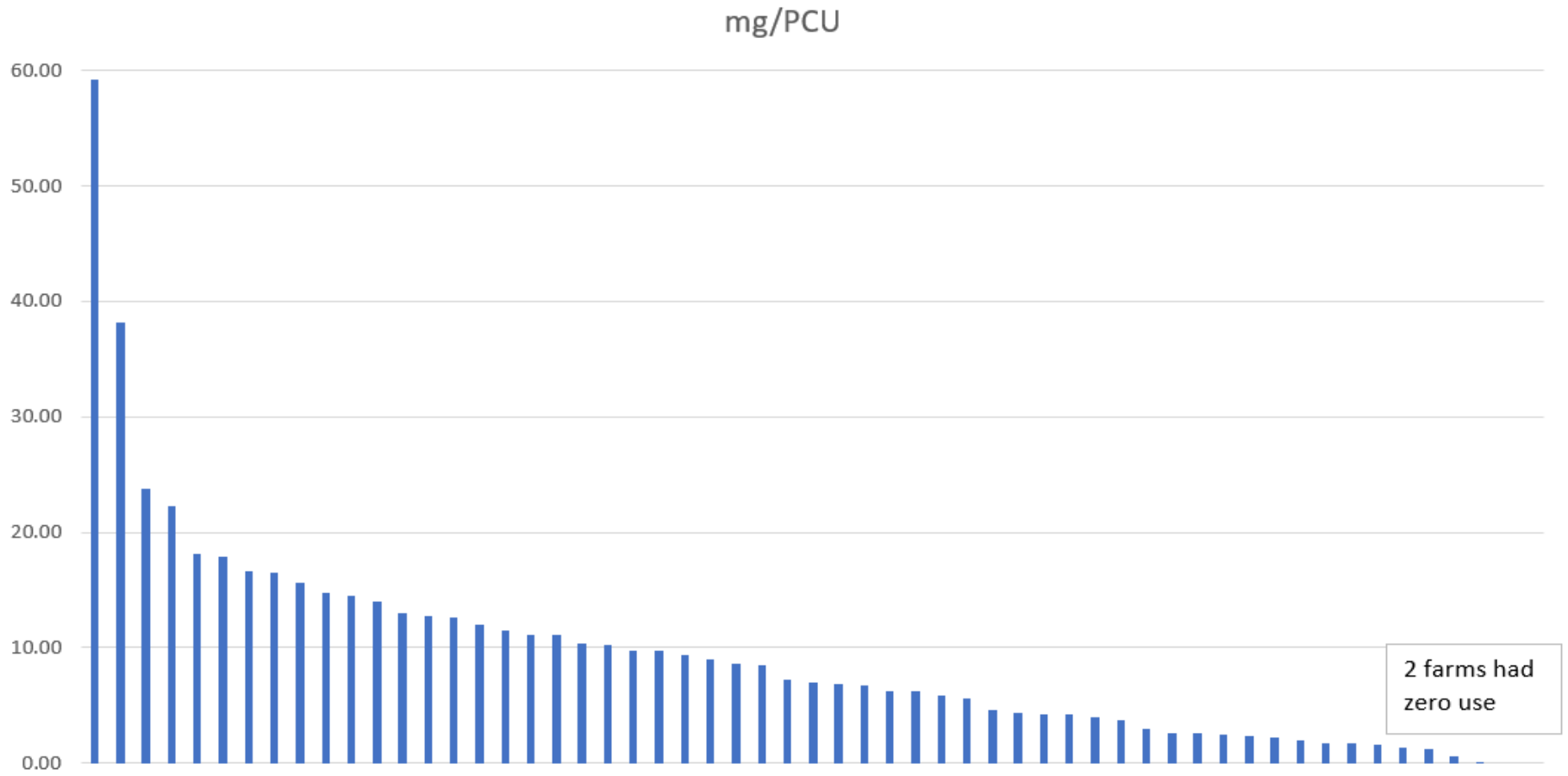
DAIRY CATTLE	BEEF ADULT	BEEF (0-1 YR)	BEEF (1-2 YR)	SHEEP BREEDING ADULTS	SHEEP SLAUGHTERED & SOLD	PIGS - ADULT	PIGS – SLAUGHTER PIGS	PIGS - WEANERS	BROILERS	HENS LAYING
11471	5481	6227	6411	29334	34398	922	11714	80	11031	33185

Figure 2: Livestock numbers covered by this survey

The data was extracted from the individual farm reports using a Microsoft Excel benchmarking tool produced by the University of Nottingham and is displayed graphically by sector, ranked by antimicrobial usage in mg/PCU.

Antibiotic Usage Report

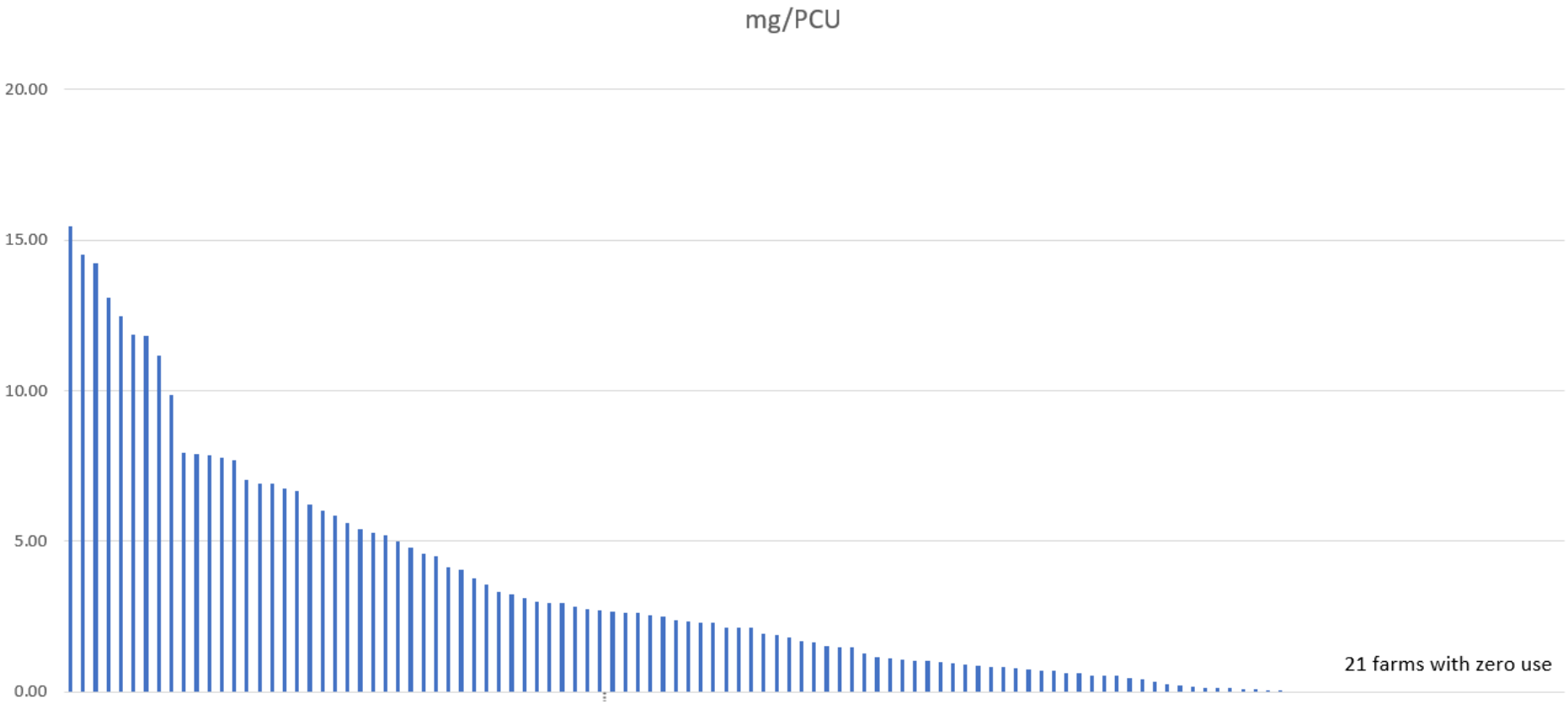
Dairy



Weighted average for sector: 10.66mg/PCU. Median farm usage: 6.98mg/PCU

Antibiotic Usage Report

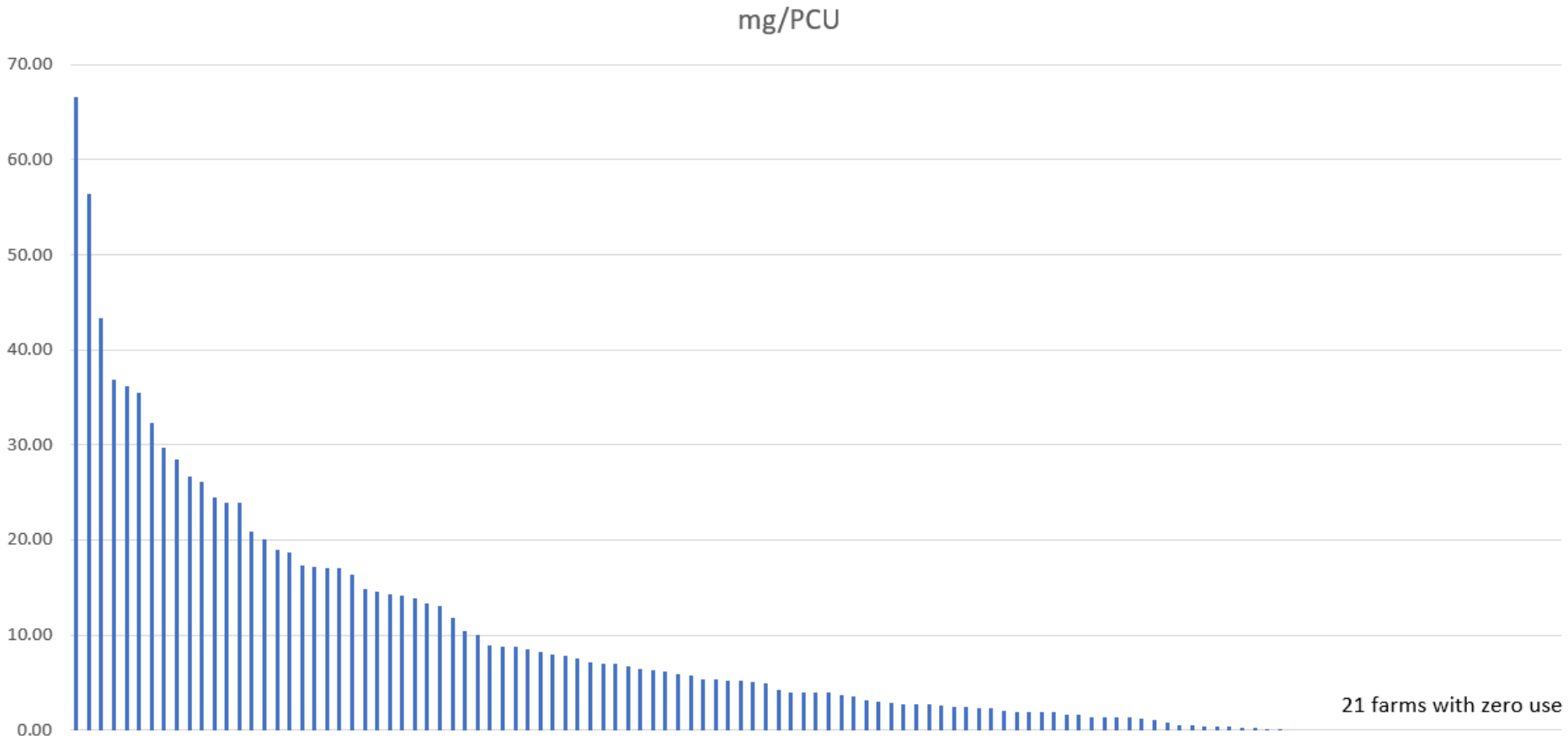
Beef Method 1 – all livestock



Farm mean: 2.95 mg/PCU, median 1.64mg/PCU (a weighted average was not calculated for this method as not ESVAC comparable)

Antibiotic Usage Report

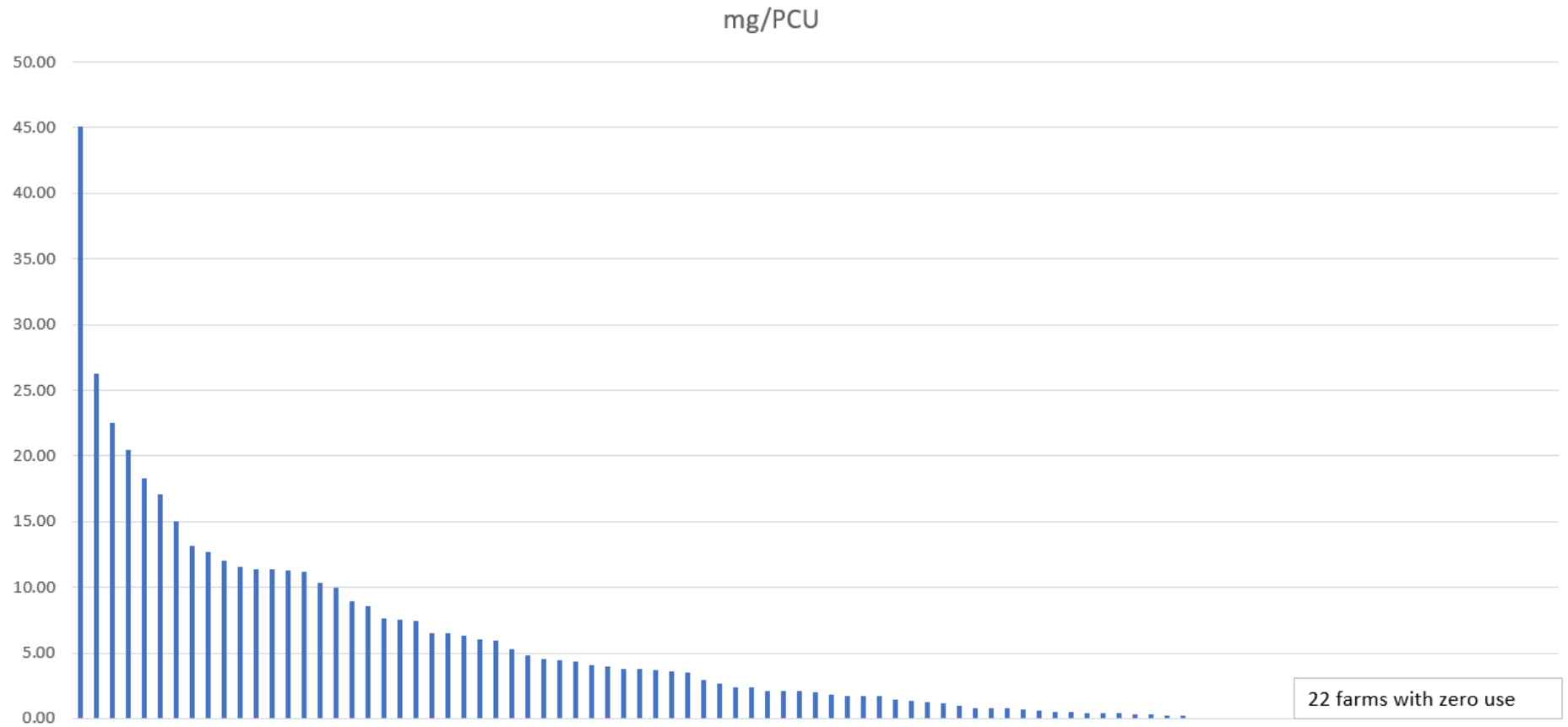
Beef Method 2 – estimated ESVAC PCU



Weighted average for sector: 7.22mg/PCU. Median farm usage: 3.97mg/PCU

Antibiotic Usage Report

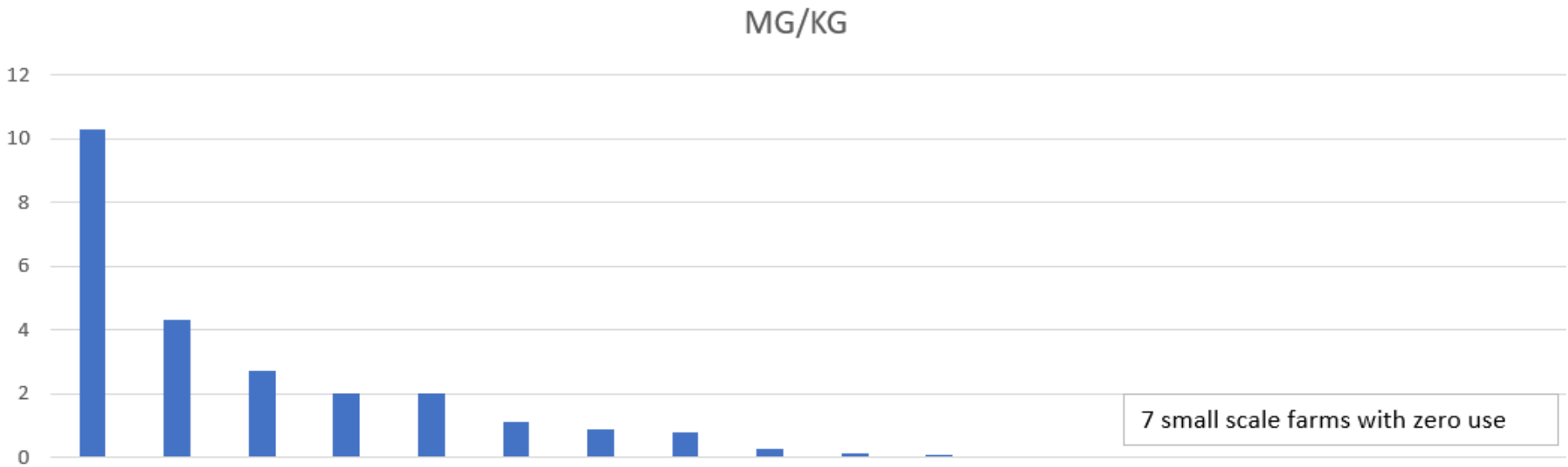
Sheep



Weighted average for sector: 3.33mg/PCU. Median farm usage: 2.04mg/PCU

Antibiotic Usage Report

Pigs



Weighted average for sector: 1.42mg/PCU. Median farm usage: 0.19mg/PCU

Broilers

All zero use except one farm at 40mg/PCU. An average figure is not very helpful in this case, but for the record:

Weighted average for sector: 2.95mg/PCU. Median farm usage is 0mg/PCU

Layers

All zero use except one farm at 0.01 bird days.

Average: 0 bird days.

Antibiotic Usage Report

Discussion

The data from this survey reflects well on the organic farming practices used by Soil Association licensees to ensure low antibiotic usage. A comparison of mean figures by sector with the industry average figures given in the UK VARSS Report (2020) is shown below in Figure 3:

Sector	Overall	Dairy	Beef	Sheep	Pigs	Broilers	Turkeys	Layers
VARSS	31	22.5	24.4	16.7*	110	17	42	0.68
Organic	7.46	10.66	7.22	3.33	1.42	2.95	0	0

*Sheep data not available from VARSS. Average figure taken from RUMA (2019) Targets Task Force: 2 Years On, using 2017 data presented by Lovatt and Davies (2019)

Figure 3: Comparison of average antibiotic usage figures (mg/PCU) by sector for this survey compared with national average for a similar period.

Weaknesses of this survey are the relatively small sample size, especially for pigs and poultry, and that the participating farms may not be representative of the organic sector as a whole due to the self-selecting nature of the consent form return requirement. Accurate data on cattle slaughtered or sold would have improved the reliability of the beef data. The Soil Association intends to collect this data at annual certification in the future, which will make benchmarking more accurate and reliable.

Despite these reservations, the average antibiotic use in every sector in this survey can be seen to be significantly lower than the national average even after a 50% reduction over 4 years. Organic standards may therefore be considered a helpful reference for the industry as it looks to further reduce antibiotic usage. Though on course to achieve its targets for 2020 (RUMA, 2019), the targets will be continually updated and maintaining progress with a reduction in usage may be challenging once the obvious 'low hanging fruit' such as routine prophylactic use have been eliminated.

Though average use of antibiotics across this dataset is significantly lower than national average figures, they show a large range and in common with datasets referenced by RUMA (2019) the median figure tends to be much lower than the mean. In both organic and conventional sectors, a small number of heavy users of antibiotics are noticeable through benchmarking and they push up the mean figure considerably. The highest users in dairy, beef, sheep and pigs have a small number of animals relative to their peers (20 cows, 11 beef calves, 8 sheep and 8 breeding pigs respectively) and are not particularly representative. However, there are similar size enterprises with zero antibiotic use, and many of the other heavy users are large or medium sized commercial farms. Other factors are likely therefore to be more significant as drivers for antibiotic use. These may include attitude and knowledge of the

owner or stock keeper with regard to medicines or be related to aspects of stockmanship or husbandry. To add to the value of this survey, qualitative interviews were undertaken with the highest and lowest users in each sector in the autumn of 2020. The results of these interviews are presented separately. Lessons from this process will help inform the Soil Association how best to continue to help their farmers take the lead on reducing antibiotic use. It will also be applicable to the wider industry as we seek to contribute to the One Health goal of reducing the risk of widespread antibiotic resistance.

References

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Antibiotic Usage Report

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