Autoriteit Diergeneesmiddelen

Appendix to the report

Usage of Antibiotics in Agricultural Livestock in the Netherlands in 2019

Trends and benchmarking of livestock farms and veterinarians

June 2020

Autoriteit Diergeneesmiddelen

Contents

Adjusted antibiotic usage data for 2018

The SDa's previous report described a sharp increase in the amount of antibiotics used in the broiler farming sector. One of the drivers for this increase was the 2018 data provided by Statistics Netherlands (CBS) indicating a drop in the number of broilers compared with the year before. Following the publication of last year's report, the numbers of animals present within the broiler farming sector in 2018 have been adjusted. The number of animals in the turkey, pig and veal farming sectors were also adjusted.

The broiler farming sector's revised 2018 $DDDA_{NAT}$ value is 10.1, reflecting a 14.7% downward adjustment of the original value included in last year's report. The revised $DDDA_{NAT}$ value shows that antibiotic use in the broiler farming sector increased by 7.3% during the 2018 reporting year.
The turkey farming sector's 2018 $DDDA_{NAT}$ value was adjusted to 20.6, an 18.2% upward adjustment of its original value. The sector-reported numbers of animals turned out to be higher than those reported by CBS.
A slight downward adjustment of the numbers of animals present within the pig farming sector in 2018 has resulted in a 0.2% higher 2018 $DDDA_{NAT}$ value for this livestock sector. However, as $DDDA_{NAT}$ data are usually reported as one-decimal values, the pig farming sector's revised 2018 $DDDA_{NAT}$ value has remained unchanged at 8.7 $DDDA_{NAT}$.
The veal farming sector's revised 2018 $DDDA_{NAT}$ value is 18.6, reflecting a 2.2% downward adjustment of its previously reported value.
The 2018 antibiotic usage data for the other livestock sectors (i.e. the cattle and rabbit farming sectors) did not require any adjustments.

$DDDA_{NAT}$ summary

Table A1. $DDDA_{NAT}$ values for the 2015-2019 period, by livestock sector and pharmacotherapeutic group

	Broiler farming sector					Turkey farming sector					Pig farming sector				
	2015	**2016**	**2017**	**2018**	**2019**	**2015**	**2016**	**2017**	**2018**	**2019**	**2015**	**2016**	**2017**	**2018**	**2019**
Pharmacotherapeutic group															
1st-choice antibiotics	**3.86**	**2.53**	**2.39**	**2.28**	**2.57**	**19.18**	**12.29**	**8.11**	**10.82**	**10.66**	**6.97**	**6.88**	**6.61**	**6.70**	**6.26**
As a proportion of overall AB use	**26.5%**	**24.9%**	**25.4%**	**22.6%**	**26.0%**	**53.4%**	**46.5%**	**40.2%**	**52.5%**	**47.9%**	**77.1%**	**77.5%**	**76.0%**	**77.2%**	**78.7%**
Amphenicols	*	*	*	*	*	*	*	*	*	*	0.18	0.24	0.25	0.25	0.26
Macrolides/lincosamides	0.10	0.04	0.04	0.03	0.02	*	*	*	*	*	0.78	0.82	0.76	0.77	0.84
Other	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Penicillins	1.20	0.70	0.59	0.44	0.87	4.49	3.70	1.64	2.62	1.61	0.57	0.58	0.55	0.68	0.51
Pleuromutilins	*	*	*	*	*	0.12	*	0.10	0.12	*	0.08	0.07	0.09	0.12	0.09
Tetracyclines	1.49	1.01	0.95	1.04	0.90	12.57	7.63	5.51	7.15	8.13	4.14	4.07	4.05	3.86	3.54
Trimethoprim/sulfonamides	1.07	0.78	0.82	0.78	0.78	2.01	0.95	0.86	0.93	0.93	1.20	1.10	0.90	1.01	1.01
2nd-choice antibiotics	**10.60**	**7.55**	**6.96**	**7.74**	**7.24**	**14.92**	**11.93**	**10.99**	**9.06**	**10.99**	**1.69**	**1.71**	**1.83**	**1.67**	**1.36**
As a proportion of overall AB use	**72.7%**	**74.1%**	**73.7%**	**76.4%**	**73.1%**	**41.5%**	**45.1%**	**54.5%**	**43.9%**	**49.4%**	**18.7%**	**19.3%**	**21.1%**	**19.3%**	**17.1%**
Aminoglycosides	0.02	0.01	0.03	0.02	0.01	0.71	0.69	0.05	0.00	*	0.01	0.00	0.01	0.03	0.03
Aminopenicillins	7.23	5.78	5.00	5.19	5.37	12.13	10.05	9.37	7.52	9.16	1.36	1.39	1.41	1.24	0.97
1st- and 2nd-gen. cephalosporins	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quinolones	2.86	1.51	1.72	2.29	1.62	0.10	0.01	0.26	0.18	0.16	0.03	0.02	0.03	0.02	0.04
Fixed-dose combinations	0.11	0.05	0.01	0.02	0.01	*	*	*	*	0.01	0.04	0.03	0.02	0.02	0.02
Macrolides/lincosamides	0.38	0.21	0.20	0.22	0.24	1.98	1.18	1.30	1.35	1.66	0.25	0.26	0.37	0.37	0.30
3rd-choice antibiotics	**0.13**	**0.11**	**0.08**	**0.10**	**0.09**	**1.84**	**2.21**	**1.06**	**0.75**	**0.61**	**0.38**	**0.28**	**0.26**	**0.31**	**0.34**
As a proportion of overall AB use	**0.9%**	**1.1%**	**0.9%**	**1.0%**	**0.9%**	**5.1%**	**8.4%**	**5.3%**	**3.6%**	**2.7%**	**4.2%**	**3.2%**	**2.9%**	**3.6%**	**4.3%**
3rd- and 4th-gen. cephalosporins	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Fluoroquinolones	0.07	0.07	0.05	0.06	0.04	1.20	1.60	1.06	0.75	0.59	0.00	0.00	0.00	0.00	0.00
Polymyxins	0.06	0.04	0.03	0.04	0.05	0.63	0.61	*	*	0.02	0.38	0.28	0.26	0.31	0.34
Overall antibiotic use	**14.59**	**10.19**	**9.44**	**10.13**	**9.90**	**35.94**	**26.42**	**20.16**	**20.62**	**22.25**	**9.03**	**8.87**	**8.70**	**8.68**	**7.96**

Table A1. (continued)

	Dairy cattle farming sector					Veal farming sector					Non-dairy cattle farming sector				
	2015	**2016**	**2017**	**2018**	**2019**	**2015**	**2016**	**2017**	**2018**	**2019**	**2015**	**2016**	**2017**	**2018**	**2019**
Pharmacotherapeutic group															
1st-choice antibiotics	**2.27**	**2.23**	**2.35**	**2.40**	**2.39**	**18.99**	**17.94**	**17.30**	**16.09**	**14.15**	**0.86**	**0.91**	**0.92**	**0.94**	**0.71**
As a proportion of overall AB use	**73.1%**	**74.0%**	**76.9%**	**79.0%**	**79.9%**	**86.1%**	**85.9%**	**85.9%**	**86.4%**	**85.6%**	**86.0%**	**85.0%**	**84.2%**	**86.7%**	**85.5%**
Amphenicols	0.06	0.06	0.05	0.05	0.05	1.63	1.59	1.44	1.33	1.28	0.10	0.11	0.11	0.10	0.08
Macrolides/lincosamides	0.09	0.06	0.05	0.05	0.06	3.70	3.35	3.43	3.21	3.05	0.15	0.15	0.16	0.14	0.11
Other	*	*	*	*	*	*	*	*	*	*	*	*	*	0.00	0.00
Penicillins	1.50	1.52	1.69	1.76	1.75	0.42	0.48	0.46	0.43	0.39	0.09	0.10	0.11	0.10	0.09
Pleuromutilins	*	*	*	*	*	*	*	*	*	*	*	*	*	0.00	0.00
Tetracyclines	0.37	0.35	0.32	0.32	0.30	11.01	10.47	10.35	9.86	8.23	0.42	0.44	0.45	0.53	0.38
Trimethoprim/sulfonamides	0.25	0.24	0.24	0.23	0.24	2.22	2.05	1.61	1.25	1.21	0.10	0.10	0.09	0.06	0.05
2nd-choice antibiotics	**0.83**	**0.77**	**0.70**	**0.63**	**0.59**	**2.86**	**2.85**	**2.78**	**2.50**	**2.35**	**0.13**	**0.16**	**0.17**	**0.14**	**0.12**
As a proportion of overall AB use	**26.6%**	**25.7%**	**22.8%**	**20.8%**	**19.9%**	**13.0%**	**13.7%**	**13.8%**	**13.4%**	**14.2%**	**13.3%**	**14.6%**	**15.6%**	**12.9%**	**14.2%**
Aminoglycosides	0.01	0.01	0.01	0.01	0.01	0.19	0.23	0.23	0.20	0.16	0.01	0.01	0.01	0.01	0.00
Aminopenicillins	0.37	0.34	0.31	0.29	0.28	1.91	1.77	1.75	1.65	1.52	0.07	0.06	0.08	0.06	0.06
1st- and 2nd-gen. cephalosporins	0.02	0.03	0.03	0.03	0.03	*	*	*	*	*	0.00	0.00	0.00	0.00	0.00
Quinolones	0.00	0.00	0.00	0.00	0.00	0.58	0.66	0.57	0.36	0.41	0.02	0.03	0.02	0.01	0.01
Fixed-dose combinations	0.42	0.38	0.34	0.29	0.27	0.00	0.00	0.01	0.00	0.00	0.03	0.03	0.04	0.03	0.02
Macrolides/lincosamides	0.01	0.01	0.01	0.01	0.01	0.18	0.19	0.23	0.28	0.26	0.01	0.02	0.02	0.03	0.02
3rd-choice antibiotics	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.21**	**0.09**	**0.06**	**0.04**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
As a proportion of overall AB use	**0.4%**	**0.3%**	**0.2%**	**0.2%**	**0.2%**	**0.9%**	**0.4%**	**0.3%**	**0.2%**	**0.1%**	**0.7%**	**0.4%**	**0.2%**	**0.4%**	**0.3%**
3rd- and 4th-gen. cephalosporins	0.00	0.00	0.00	0.00	0.00	*	*	*	*	*	0.00	0.00	0.00	0.00	0.00
Fluoroquinolones	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Polymyxins	0.01	0.01	0.00	0.00	0.00	0.19	0.07	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Overall antibiotic use	**3.11**	**3.01**	**3.06**	**3.04**	**2.99**	**22.05**	**20.88**	**20.13**	**18.63**	**16.52**	**1.00**	**1.07**	**1.10**	**1.08**	**0.83**

Table A1. (continued)

	Rabbit farming sector			
	2016	**2017**	**2018**	**2019**
Pharmacotherapeutic group				
1st-choice antibiotics	**30.92**	**24.22**	**32.65**	**30.44**
As a proportion of overall AB use	**75.5%**	**80.6%**	**74.8%**	**77.1%**
Amphenicols	0.00	*	*	*
Macrolides/lincosamides	1.07	1.74	2.67	5.15
Other	16.37	12.36	16.55	13.25
Penicillins	*	*	0.00	*
Pleuromutilins	1.38	1.68	3.37	4.02
Tetracyclines	10.49	7.76	9.93	7.13
Trimethoprim/sulfonamides	1.62	0.69	0.13	0.89
2nd-choice antibiotics	**9.67**	**5.73**	**10.46**	**8.39**
As a proportion of overall AB use	**23.6%**	**19.0%**	**24.0%**	**21.2%**
Aminoglycosides	9.66	5.73	10.22	8.33
Aminopenicillins	*	*	*	*
1st- and 2nd-gen. cephalosporins	*	*	*	*
Quinolones	*	*	*	*
Fixed-dose combinations	*	*	*	*
Macrolides/lincosamides	0.01	*	0.24	0.05
3rd-choice antibiotics	**0.34**	**0.12**	**0.57**	**0.68**
As a proportion of overall AB use	**0.8%**	**0.4%**	**1.3%**	**1.7%**
3rd- and 4th-gen. cephalosporins	*	*	*	*
Fluoroquinolones	0.25	0.12	0.29	0.11
Polymyxins	0.09	*	0.28	0.57
Overall antibiotic use	**40.93**	**30.07**	**43.68**	**39.51**

Table A2. Reductions in the amount of antibiotics used in agricultural livestock, compared to 2009 levels

	$DDDA_{NAT}$	**Reduction from the 2009 level, in %**									**$DDDA_{NAT}$**
Livestock sector	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019
Broiler farming sector	36.76	37	43	52	65	57	60	72	74	72	73	9.90
Pig farming sector	20.51	26	29	30	51	54	56	57	58	58	61	7.96
Dairy cattle farming sector	5.78	-10	-1	30	30	43	46	48	47	47	48	2.99
Veal farming sector	33.80	9	14	24	36	37	35	38	40	45	51	16.52

Mass balance

Table A3. Kilograms of antibiotics used (by livestock sector and for all livestock sectors combined) and sold in 2019, by pharmacotherapeutic group

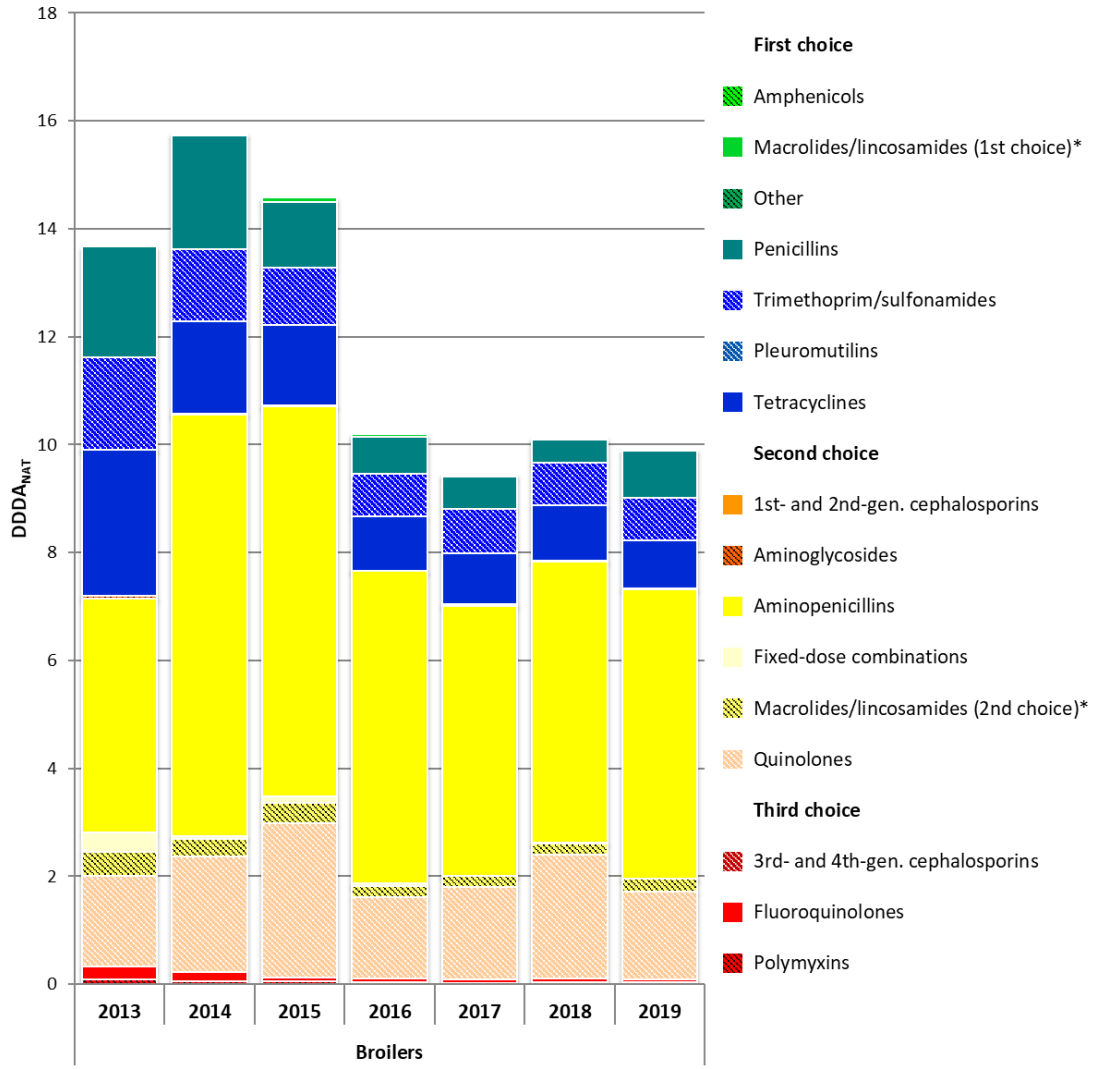
	Kilograms used, according to delivery records									
Pharmacotherapeutic group	**Broiler farming sector**	**Turkey farming sector**	**Pig farming sector**	**Dairy cattle farming sector**	**Veal farming sector**	**Non-dairy cattle farming sector**	**Rabbit farming sector**	**Other poultry farming subsectors**	**All livestock sectors combined**	**Kilograms sold**
1st-choice antibiotics	**4,023**	**1,244**	**54,401**	**9,415**	**40,668**	**5,478**	**301**	**2,341**	**117,870**	**119,079**
As a proportion of overall AB use/sales	**42.4%**	**72.4%**	**83.3%**	**83.5%**	**82.6%**	**85.2%**	**69.2%**	**77.2%**	**80.2%**	**79.2%**
Amphenicols	0	0	1,349	454	2,337	421	0	0	4,562	4,374
Fixed-dose combinations	0	0	0	0	0	0	0	0	0	393
Macrolides/lincosamides	647	422	7,945	389	13,594	1,438	45	846	25,327	22,883
Other	0	0	0	0	0	0	69	0	69	610
Penicillins	711	86	4,372	3,246	509	294	0	577	9,794	10,304
Pleuromutilins	0	0	696	0	0	0	59	60	816	758
Tetracyclines	855	653	25,624	1,588	17,990	2,649	71	564	49,994	50,871
Trimethoprim/sulfonamides	1,810	83	14,414	3,737	6,238	677	56	294	27,307	28,885
2nd-choice antibiotics	**5,433**	**456**	**9,863**	**1,850**	**8,543**	**949**	**130**	**439**	**27,662**	**29,746**
As a proportion of overall AB use/sales	**57.3%**	**26.5%**	**15.1%**	**16.4%**	**17.4%**	**14.8%**	**30.0%**	**14.5%**	**18.8%**	**19.8%**
Aminoglycosides	28	0	191	212	259	32	130	0	852	1,057
Aminopenicillins	4,602	450	8,686	1,055	6,916	619	0	238	22,565	24,026
1st- and 2nd-gen. cephalosporins	0	0	0	22	0	0	0	0	22	431
Quinolones	791	5	388	3	1,344	145	0	94	2,768	2,477
Fixed-dose combinations	13	1	529	553	5	148	0	0	1,250	1,646
Macrolides/lincosamides	0	0	69	4	19	4	0	108	204	110
3rd-choice antibiotics	**28**	**19**	**1,076**	**17**	**15**	**6**	**4**	**251**	**1,414**	**1,594**
As a proportion of overall AB use/sales	**0.3%**	**1.1%**	**1.7%**	**0.2%**	**0.0%**	**0.1%**	**0.8%**	**8.3%**	**1.0%**	**1.1%**
3rd- and 4th-gen. cephalosporins	0	0	0	0	0	0	0	0	0	3
Fluoroquinolones	19	19	0	13	4	1	1	26	84	182
Polymyxins	8	0	1,075	4	11	4	3	224	1,329	1,410
Overall	**9,483**	**1,719**	**65,339**	**11,281**	**49,226**	**6,433**	**434**	**3,031**	**146,945**	**150,419**

Detailed antibiotic usage data by livestock sector

Broiler farming sector

1. Antibiotic use in $DDDA_{NAT}$

Figure A1. $DDDA_{NAT}$ trends in the broiler farming sector over the 2013-2019 period, by pharmacotherapeutic group



* In the poultry farming sector, all macrolides/lincosamides (with the exception of lincomycin and spiramycin) are categorized as second-choice antibiotics. In other livestock sectors, only long-acting macrolides are categorized as second-choice antibiotics.

2. Antibiotic use in $DDDA_F$

2.1 All broiler farms combined

Number of broiler farms: 819
Number of broiler farms with $DDDA_F$=0: 315 (38.5%)
Number of broiler farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of broiler farms that used fluoroquinolones: 22 (2.7%)
Number of broiler farms that used polymyxins: 8 (1.0%)

Table A4. Antibiotic use in $DDDA_F$ at broiler farms from 2016 to 2019*

Year	N	Mean	Median	P75	P90
2016	853	10.1	5.2	14.6	27.2
2017	852	10.3	4.4	14.4	27.1
2018	834	10.6	5.1	14.5	26.7
2019	819	8.6	3.4	13.6	24.0

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A2. 2013, 2018 and 2019 $DDDA_F$ distributions for broiler farms, with 2018 and 2019 $DDDA_F$ values based on standardized body weights

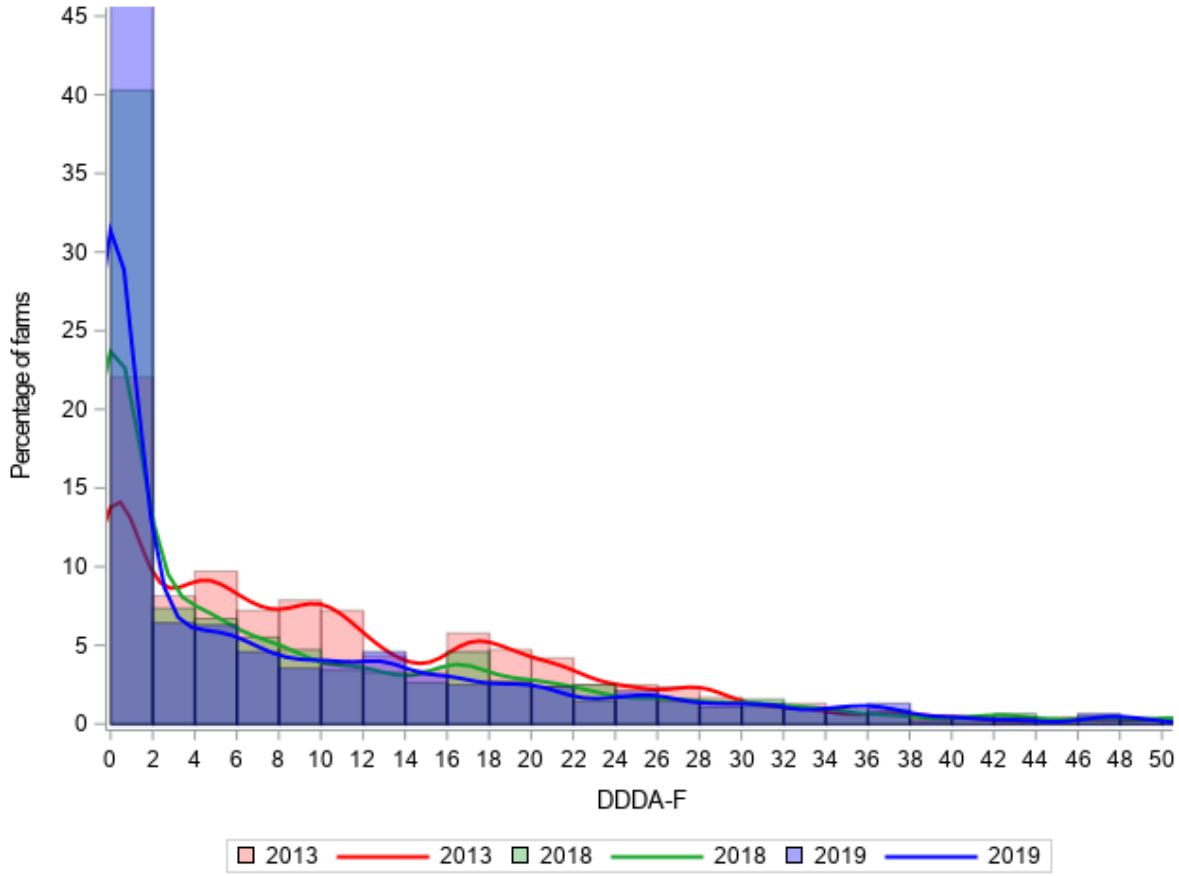


Table A5. Antibiotic use in $DDDA_F$ at broiler farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Macrolides/lincosamides	Oral	803	0.00	0.00	0.07
1st choice	Penicillins	Oral	714	0.00	0.00	0.60
1st choice	Tetracyclines	Oral	637	0.00	0.00	0.85
1st choice	Trimethoprim/sulfonamides	Oral	481	0.00	3.94	2.69
2nd choice	Aminoglycosides	Oral	815	0.00	0.00	0.01
2nd choice	Aminopenicillins	Oral	485	0.00	4.22	3.15
2nd choice	Quinolones	Oral	626	0.00	0.00	1.03
2nd choice	Fixed-dose combinations	Oral	816	0.00	0.00	0.02
2nd choice	Macrolides/lincosamides	Oral	742	0.00	0.00	0.09
3rd choice	Fluoroquinolones	Oral	797	0.00	0.00	0.07
3rd choice	Polymyxins	Oral	811	0.00	0.00	0.03

2.2 Broiler farms with conventional breeds

Number of broiler farms with conventional breeds: 455
Number of broiler farms with conventional breeds with $DDDA_F$=0: 103 (22.6%)
Number of broiler farms with conventional breeds that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of broiler farms with conventional breeds that used fluoroquinolones: 20 (4.4%)
Number of broiler farms with conventional breeds that used polymyxins: 8 (1.8%)

Table A6. Antibiotic use in $DDDA_F$ at broiler farms with conventional breeds from 2016 to 2019*

Year	N	Mean	Median	P75	P90
2016	570	12.3	8.5	17.5	29.7
2017	487	13.9	9.3	19.5	33.3
2018	498	14.3	10.1	20.0	34.0
2019	455	13.1	10.1	19.2	30.4

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A3. 2018 and 2019 $DDDA_F$ distributions for broiler farms with conventional breeds

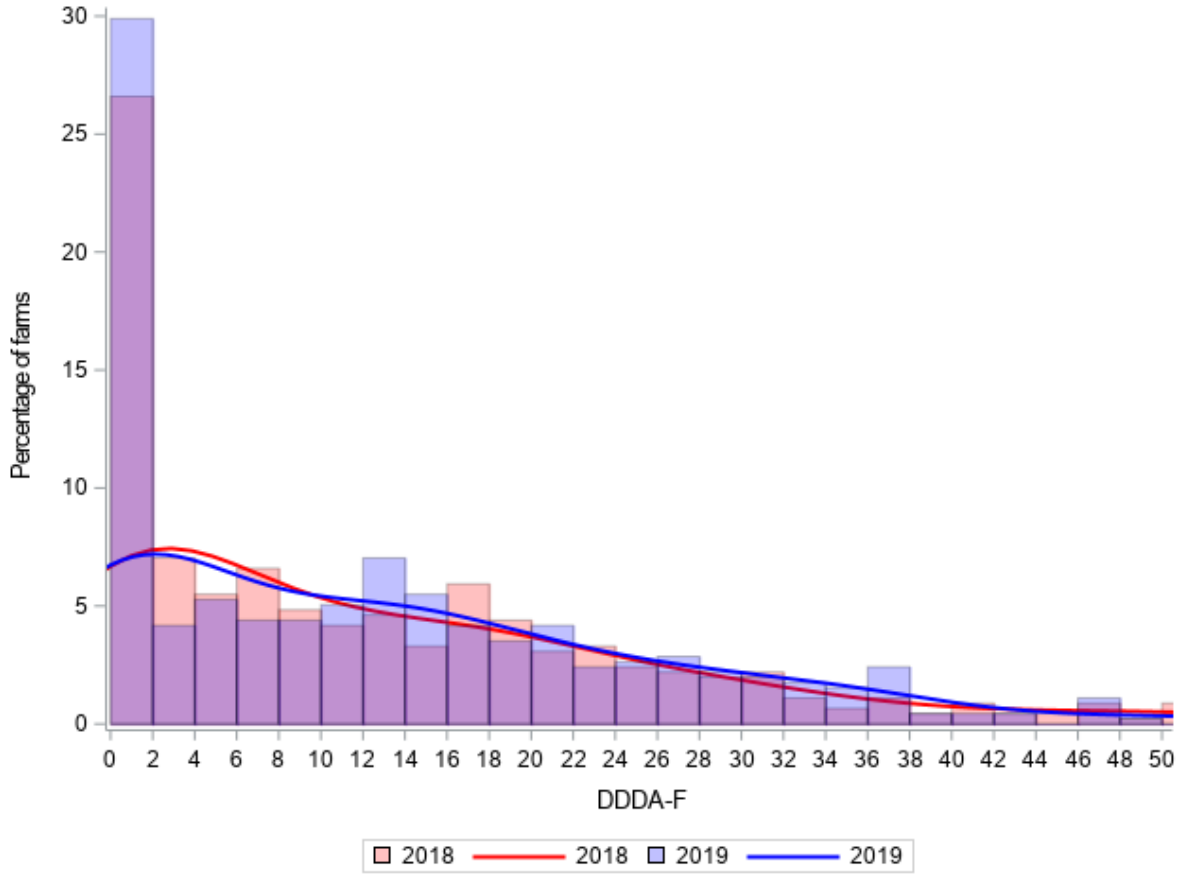
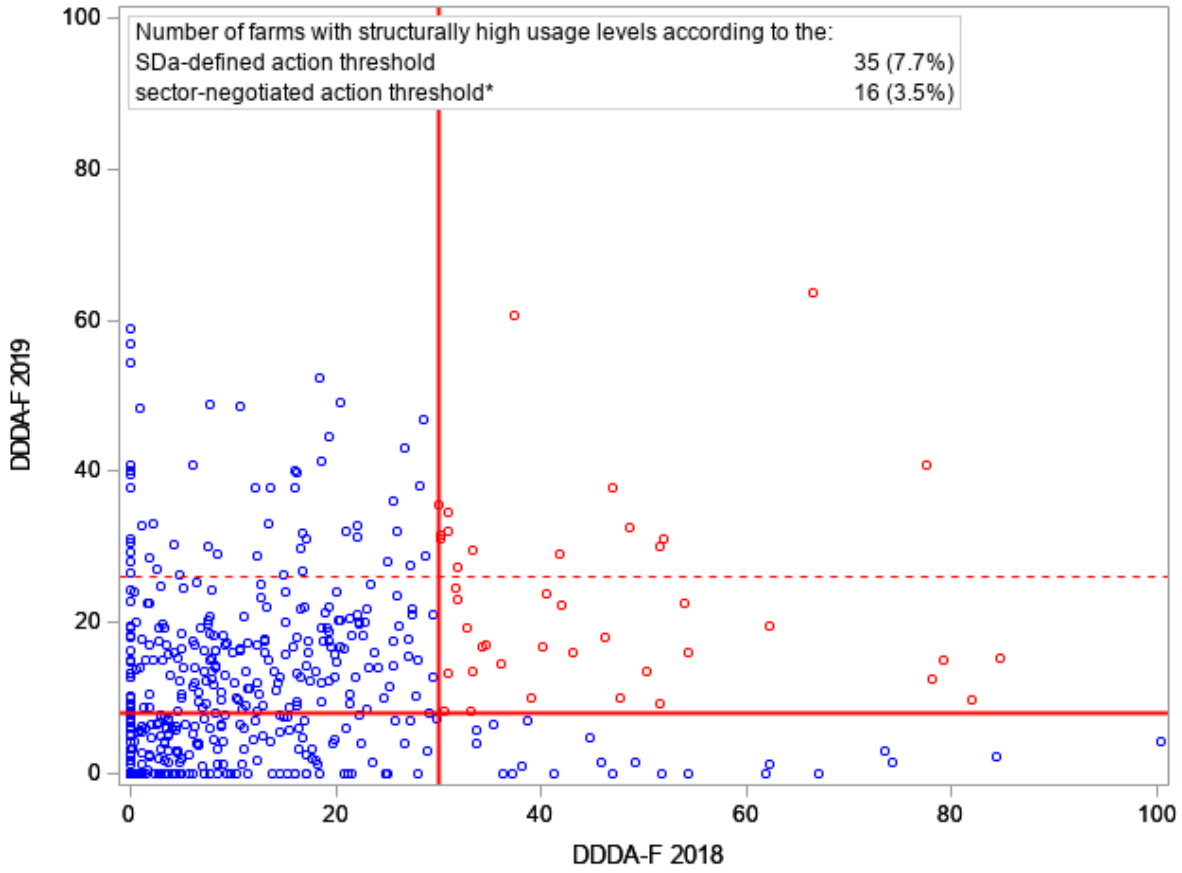


Figure A4. Scatter plot of 2018 and 2019 $DDDA_F$ values for broiler farms with conventional breeds. The red solid lines represent the action thresholds defined by the SDa. The red dotted line represents the transitional action threshold negotiated by the livestock sector. For each type of action threshold, the number of farms with structurally high usage levels is listed in the upper-left corner of the scatter plot



* The transitional action threshold agreed upon by the livestock sector and the Ministry of Agriculture, Nature and Food Quality only applies to the 2019 data. The SDa's former action threshold was used to determine which farms recorded high usage levels for 2018.

Table A7. Antibiotic use in $DDDA_F$ at broiler farms with conventional breeds in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	33	0.00	0.00	1.78
1st choice	Tetracyclines	Oral	14	4.10	7.92	4.96
1st choice	Trimethoprim/sulfonamides	Oral	34	0.00	0.00	1.38
2nd choice	Aminopenicillins	Oral	18	1.72	6.57	7.25
2nd choice	Quinolones	Oral	40	0.00	0.00	0.18
2nd choice	Fixed-dose combinations	Oral	42	0.00	0.00	0.06
2nd choice	Macrolides/lincosamides	Oral	14	0.79	2.40	1.75
3rd choice	Fluoroquinolones	Oral	28	0.00	1.21	1.25
3rd choice	Polymyxins	Oral	42	0.00	0.00	0.08

2.3 Broiler farms with alternative breeds

Number of broiler farms with alternative breeds: 471
Number of broiler farms with alternative breeds with $DDDA_F$=0: 295 (62.6%)
Number of broiler farms with alternative breeds that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of broiler farms with alternative breeds that used fluoroquinolones: 2 (0.4%)
Number of broiler farms with alternative breeds that used polymyxins: 0 (0.0%)

Table A8. Antibiotic use in $DDDA_F$ at broiler farms with alternative breeds from 2016 to 2019*

Year	N	Mean	Median	P75	P90
2016	461	3.6	0.0	3.8	11.9
2017	493	4.1	0.0	5.0	12.6
2018	475	3.6	0.0	4.9	10.6
2019	471	2.3	0.0	2.8	7.8

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A5. 2018 and 2019 $DDDA_F$ distributions for broiler farms with alternative breeds

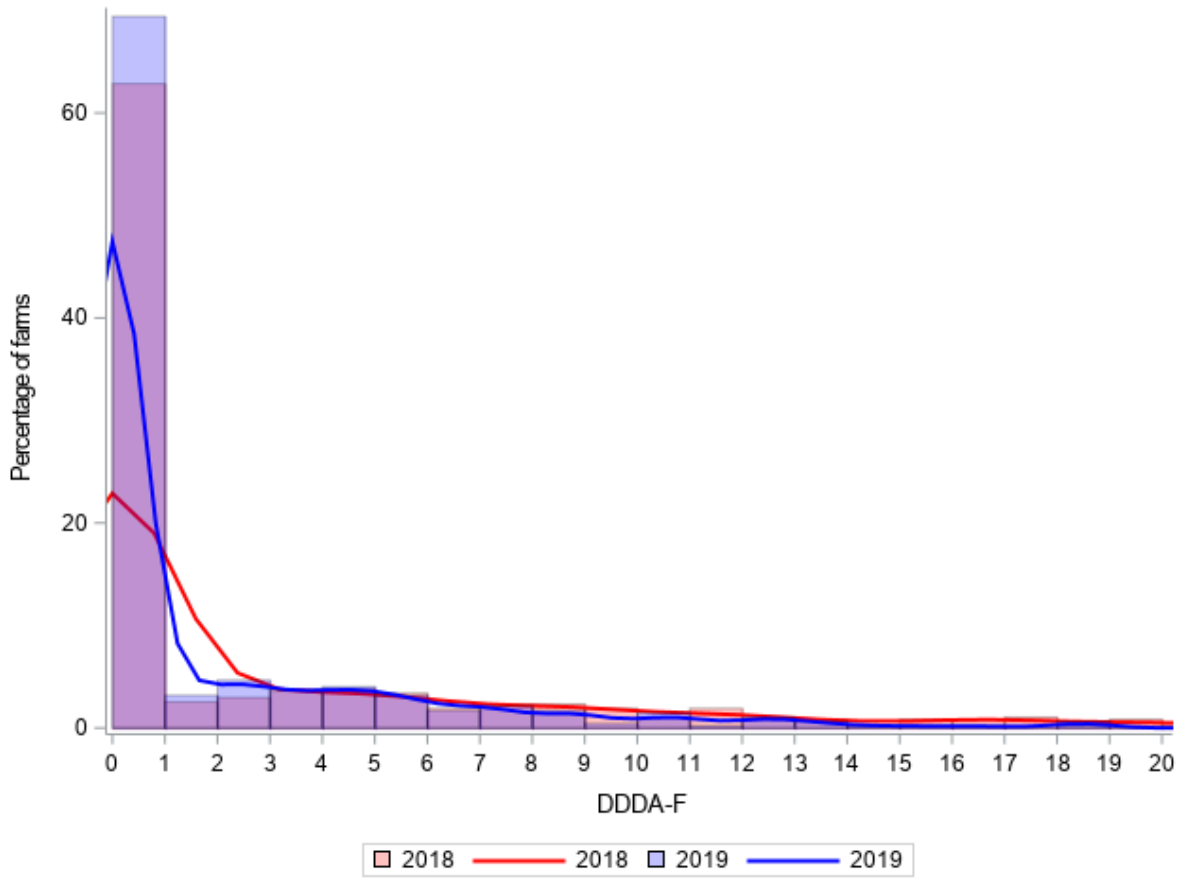
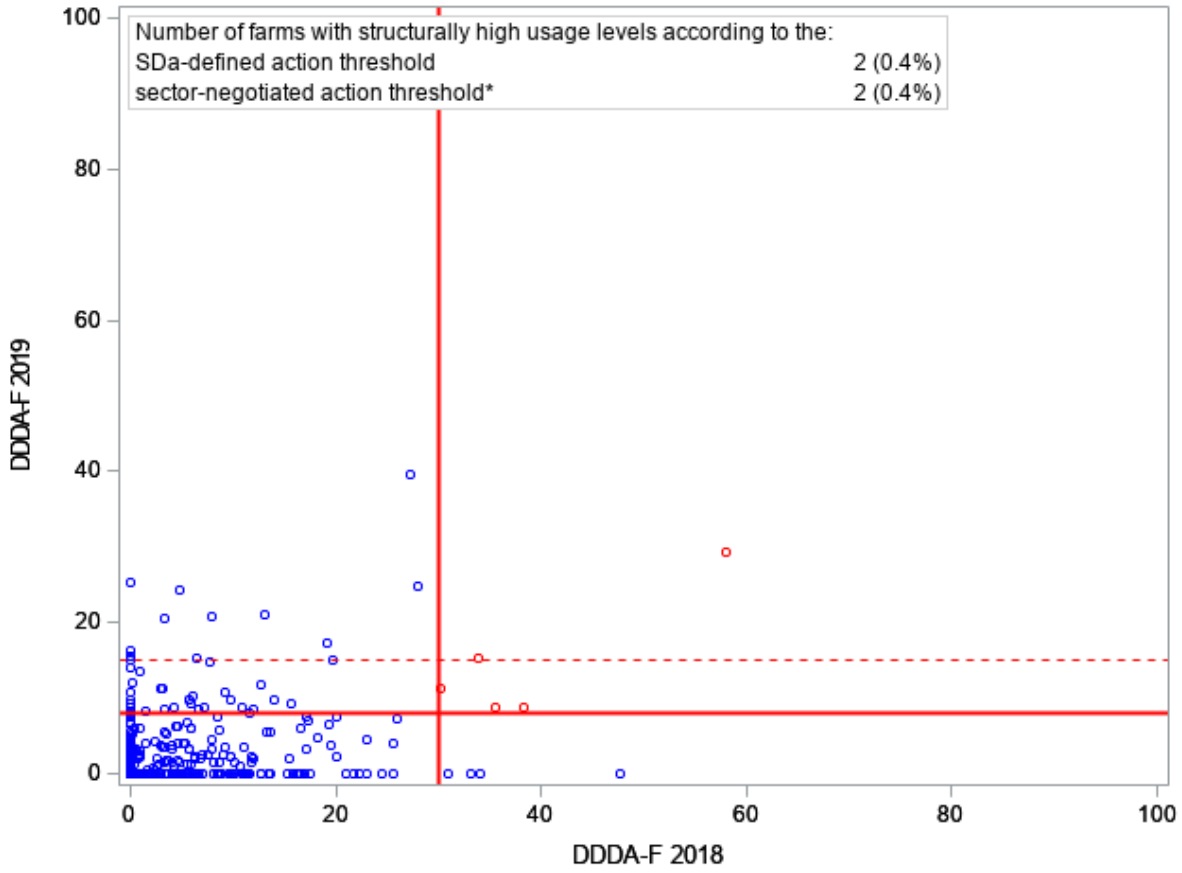


Figure A6. Scatter plot of 2018 and 2019 $DDDA_F$ values for broiler farms with alternative breeds. The red solid lines represent the action thresholds defined by the SDa. The red dotted line represents the transitional action threshold negotiated by the livestock sector. For each type of action threshold, the number of farms with structurally high usage levels is listed in the upper-left corner of the scatter plot



* The transitional action threshold agreed upon by the livestock sector and the Ministry of Agriculture, Nature and Food Quality only applies to the 2019 data. The SDa's former action threshold was used to determine which farms recorded high usage levels for 2018.

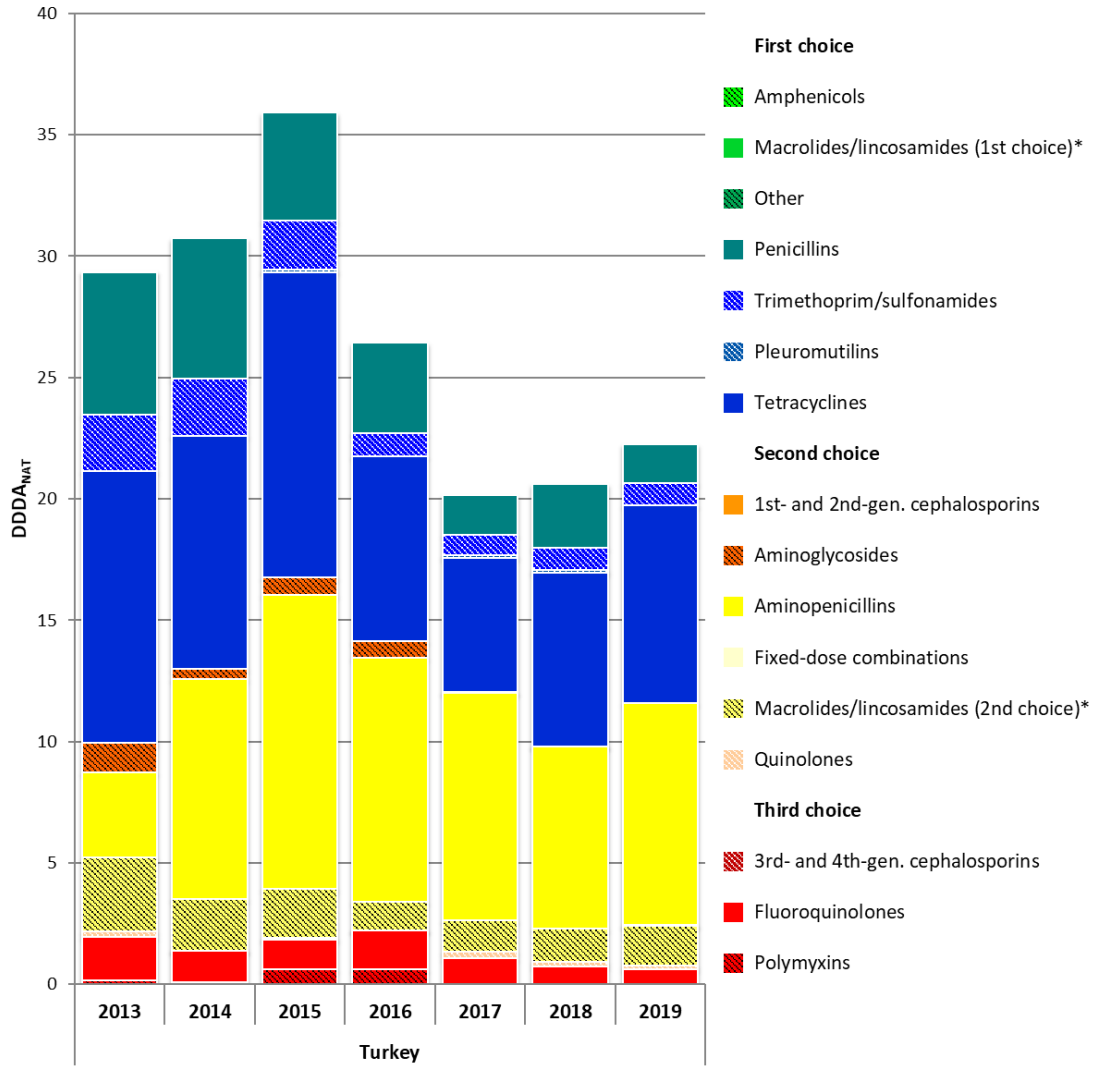
Table A9. Antibiotic use in $DDDA_F$ at broiler farms with alternative breeds in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Macrolides/lincosamides	Oral	470	0.00	0.00	0.01
1st choice	Penicillins	Oral	445	0.00	0.00	0.24
1st choice	Tetracyclines	Oral	417	0.00	0.00	0.47
1st choice	Trimethoprim/sulfonamides	Oral	394	0.00	0.00	0.74
2nd choice	Aminopenicillins	Oral	407	0.00	0.00	0.53
2nd choice	Quinolones	Oral	430	0.00	0.00	0.28
2nd choice	Macrolides/lincosamides	Oral	463	0.00	0.00	0.01
3rd choice	Fluoroquinolones	Oral	469	0.00	0.00	0.01

Turkey farming sector

1. Antibiotic use in $DDDA_{NAT}$

Figure A7. $DDDA_{NAT}$ trends in the turkey farming sector over the 2013-2019 period, by pharmacotherapeutic group



* In the poultry farming sector, all macrolides/lincosamides (with the exception of lincomycin and spiramycin) are categorized as second-choice antibiotics. In other livestock sectors, only long-acting macrolides are categorized as second-choice antibiotics.

2. Antibiotic use in $DDDA_F$

Number of turkey farms: 43
Number of turkey farms with $DDDA_F$=0: 6 (14.0%)
Number of turkey farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of turkey farms that used fluoroquinolones: 15 (34.9%)
Number of turkey farms that used polymyxins: 1 (2.3%)

Table A10. Antibiotic use in $DDDA_F$ at turkey farms from 2016 to 2019*

Year	N	Mean	Median	P75	P90
2016	46	28.0	19.3	34.2	72.8
2017	45	18.7	10.4	25.5	59.8
2018	38	20.9	11.6	24.1	49.7
2019	43	18.7	13.2	21.5	40.1

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A8. 2013, 2018 and 2019 $DDDA_F$ distributions for turkey farms, with 2018 and 2019 $DDDA_F$ values based on standardized body weights

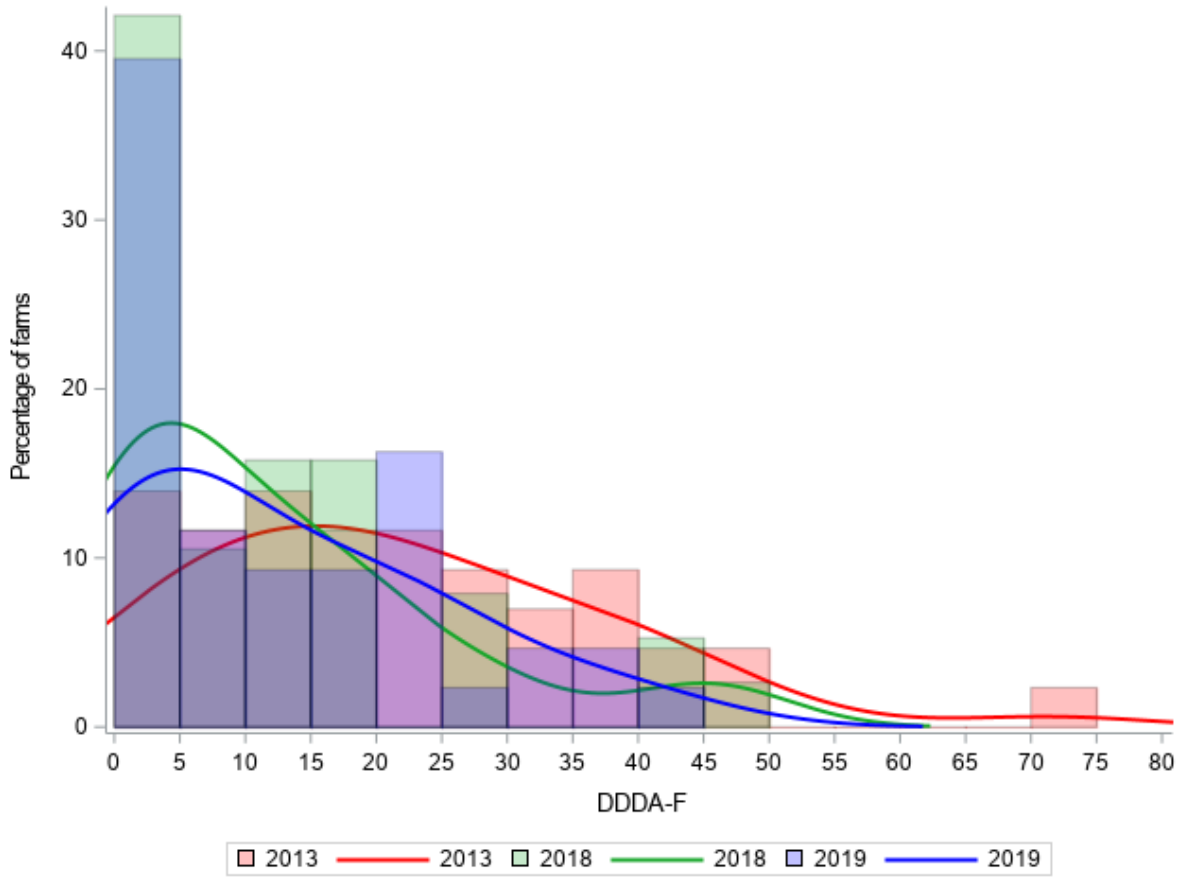
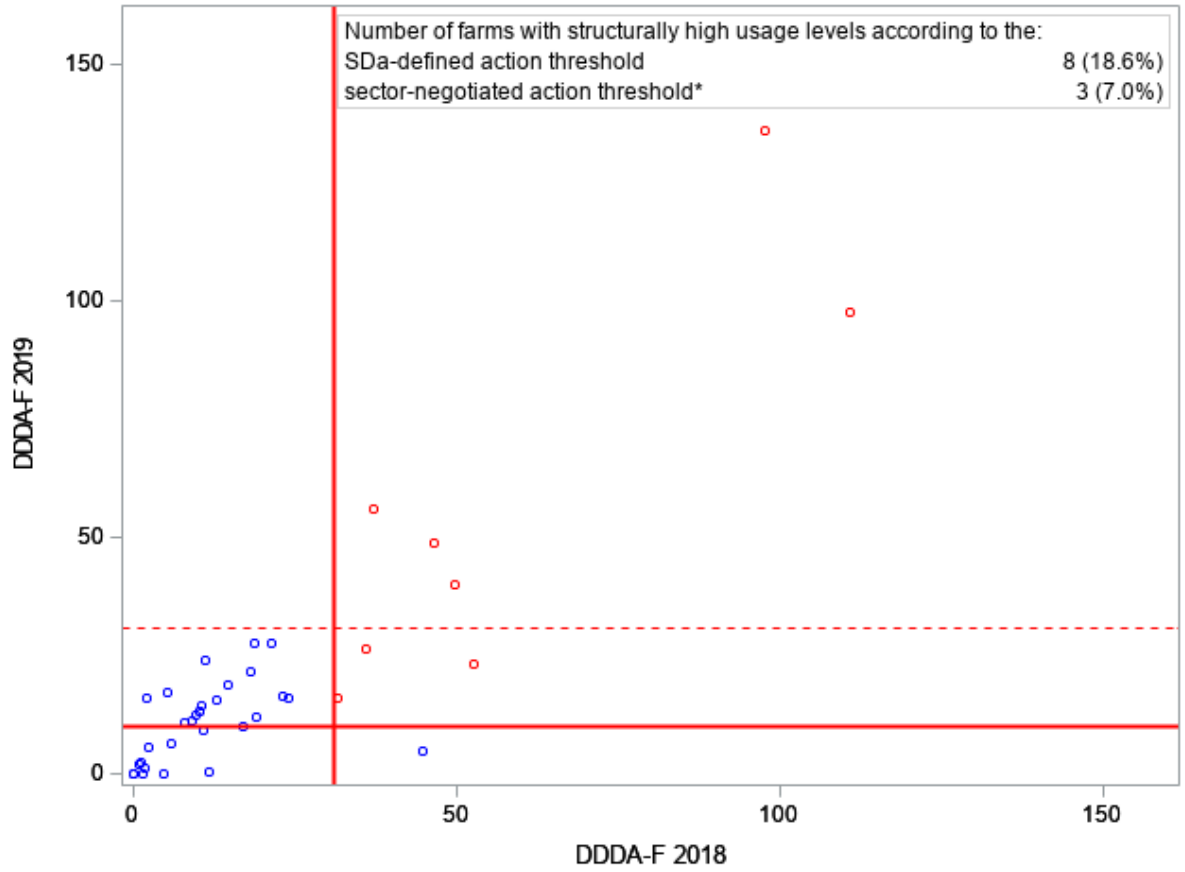


Figure A9. Scatter plot of 2018 and 2019 $DDDA_F$ values for turkey farms. The red solid lines represent the action thresholds defined by the SDa. The red dotted line represents the action threshold applied by the livestock sector. For each type of action threshold, the number of farms with structurally high usage levels is listed in the upper-right corner of the scatter plot



* As the SDa's new benchmark threshold of 10 still awaits final agreement, the turkey farming sector continues to apply its previous action threshold of 31.

Table A11. Antibiotic use in $DDDA_F$ at turkey farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	33	0.00	0.00	1.78
1st choice	Tetracyclines	Oral	14	4.10	7.92	4.96
1st choice	Trimethoprim/sulfonamides	Oral	34	0.00	0.00	1.38
2nd choice	Aminopenicillins	Oral	18	1.72	6.57	7.25
2nd choice	Quinolones	Oral	40	0.00	0.00	0.18
2nd choice	Fixed-dose combinations	Oral	42	0.00	0.00	0.06
2nd choice	Macrolides/lincosamides	Oral	14	0.79	2.40	1.75
3rd choice	Fluoroquinolones	Oral	28	0.00	1.21	1.25
3rd choice	Polymyxins	Oral	42	0.00	0.00	0.08

Layer farming sector

1. Antibiotic use in $DDDA_F$

1.1 Layer farms

Number of layer farms: 844
Number of layer farms with $DDDA_F$=0: 605 (71.7%)
Number of layer farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of layer farms that used fluoroquinolones: 0 (0.0%)
Number of layer farms that used polymyxins: 144 (17.1%)

Table A12. Antibiotic use in $DDDA_F$ at layer farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	875	0.9	0.0	0.0	3.1
2018	844	1.6	0.0	0.8	6.1
2019	844	1.8	0.0	1.0	6.6

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A10. 2018 and 2019 $DDDA_F$ distributions for layer farms (no probability density functions can be shown due to too little variation)

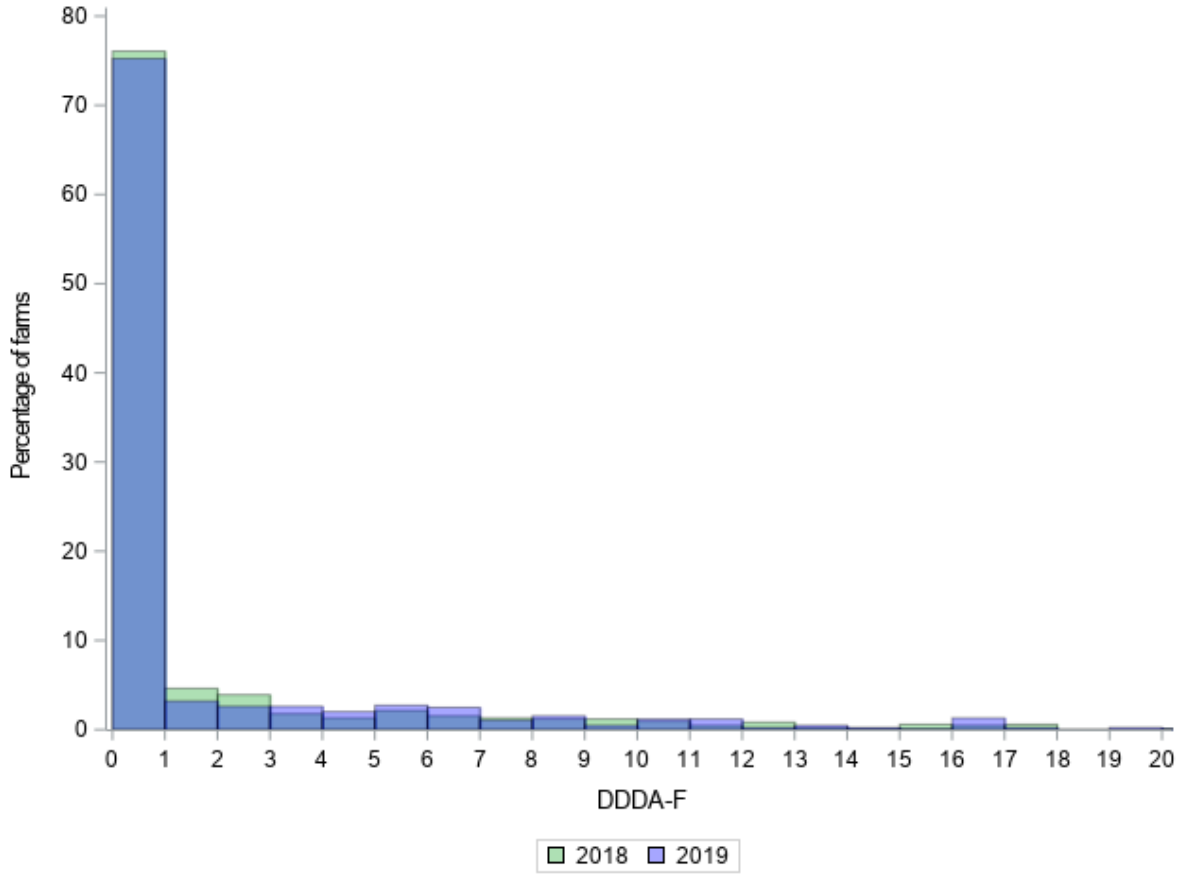


Table A13. Antibiotic use in $DDDA_F$ at layer farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	798	0.00	0.00	0.34
1st choice	Pleuromutilins	Oral	834	0.00	0.00	0.05
2nd choice	Macrolides/lincosamides	Oral	745	0.00	0.00	0.21
3nd choice	Polymyxins	Oral	700	0.00	0.00	1.22

1.2 Layer rearing farms

Number of layer rearing farms: 177
Number of layer rearing farms with $DDDA_F$=0: 103 (58.2%)
Number of layer rearing farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of layer rearing farms that used fluoroquinolones: 1 (0.6%)
Number of layer rearing farms that used polymyxins: 1 (0.6%)

Table A14. Antibiotic use in $DDDA_F$ at layer rearing farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	187	2.4	0.0	3.6	5.9
2018	176	2.3	0.0	2.7	5.8
2019	177	2.0	0.0	2.9	6.0

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A11. 2018 and 2019 $DDDA_F$ distributions for layer rearing farms (no probability density functions can be shown due to too little variation)

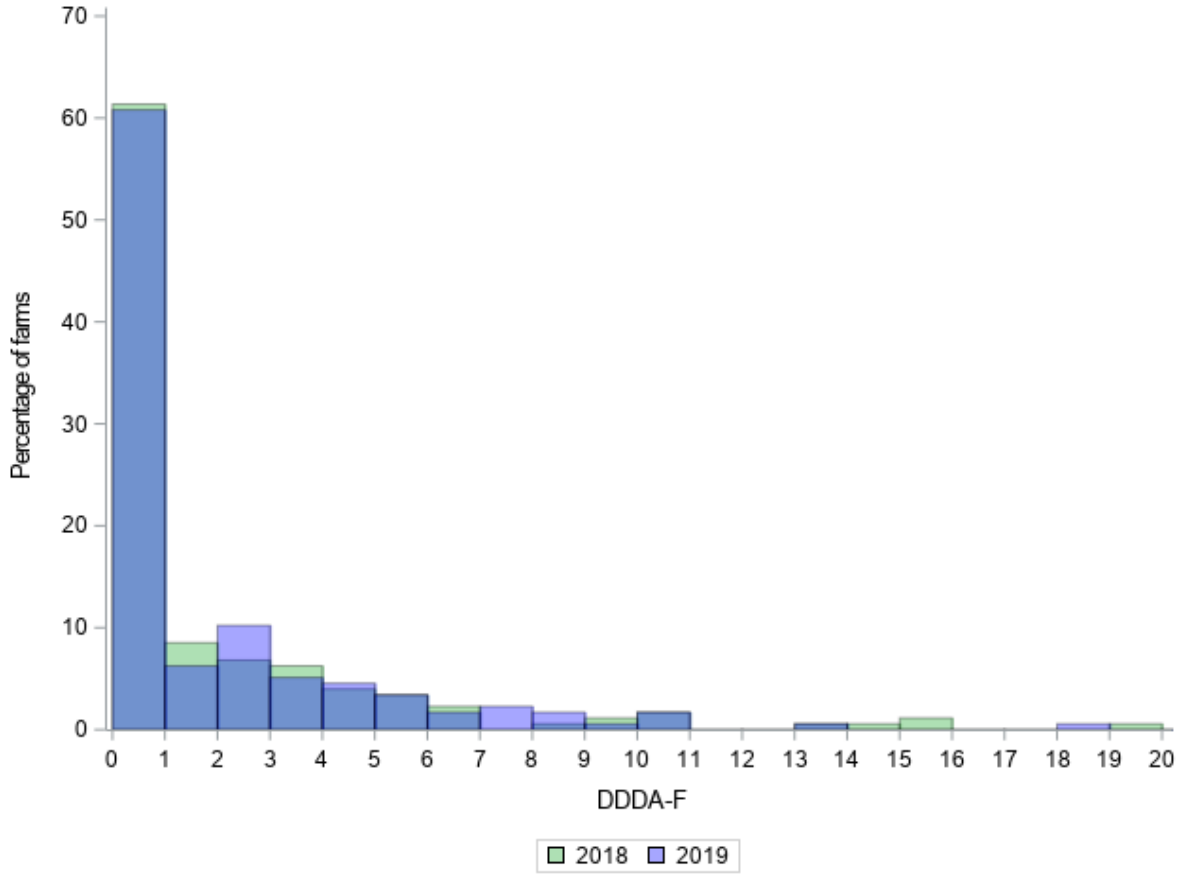


Table A15. Antibiotic use in $DDDA_F$ at layer rearing farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	129	0.00	1.34	1.01
1st choice	Tetracyclines	Oral	159	0.00	0.00	0.51
1st choice	Trimethoprim/sulfonamides	Oral	175	0.00	0.00	0.01
2nd choice	Aminopenicillins	Oral	170	0.00	0.00	0.30
2nd choice	Quinolones	Oral	176	0.00	0.00	0.05
2nd choice	Macrolides/lincosamides	Oral	166	0.00	0.00	0.10
3rd choice	Fluoroquinolones	Oral	176	0.00	0.00	0.01
3rd choice	Polymyxins	Oral	176	0.00	0.00	0.03

1.3 Parent stock rearing farms

Number of parent stock rearing farms: 16
Number of parent stock rearing farms with $DDDA_F$=0: 9 (56.3%)
Number of parent stock rearing farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of parent stock rearing farms that used fluoroquinolones: 1 (6.3%)
Number of parent stock rearing farms that used polymyxins: 0 (0.0%)

Table A16. Antibiotic use in $DDDA_F$ at parent stock rearing farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	18	9.9	0.0	11.3	20.3
2018	18	8.0	0.0	12.8	28.7
2019	16	7.6	0.0	11.2	20.9

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A12. 2018 and 2019 $DDDA_F$ distributions for parent stock rearing farms

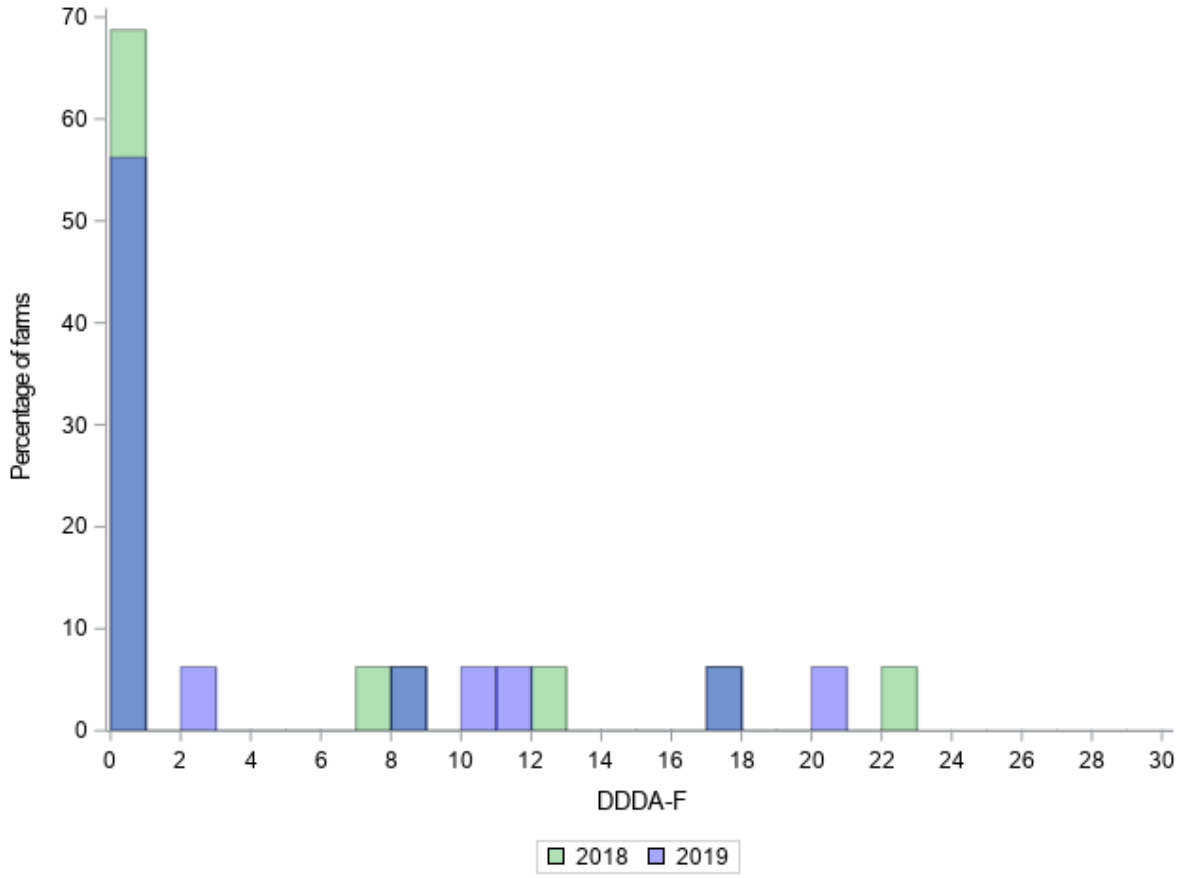


Table A17. Antibiotic use in $DDDA_F$ at parent stock rearing farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	12	0.00	1.09	1.70
1st choice	Tetracyclines	Oral	13	0.00	0.00	1.76
2nd choice	Aminopenicillins	Oral	14	0.00	0.00	3.90
3rd choice	Fluoroquinolones	Oral	15	0.00	0.00	0.26

1.4 Parent stock production farms

Number of parent stock production farms: 43
Number of parent stock production farms with $DDDA_F$=0: 26 (60.5%)
Number of parent stock production farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of parent stock production farms that used fluoroquinolones: 1 (2.3%)
Number of parent stock production farms that used polymyxins: 4 (9.3%)

Table A18. Antibiotic use in $DDDA_F$ at parent stock production farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	36	3.7	0.0	6.3	10.0
2018	37	3.6	0.0	5.7	11.9
2019	43	4.2	0.0	3.5	12.0

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A13. 2018 and 2019 $DDDA_F$ distributions for parent stock production farms

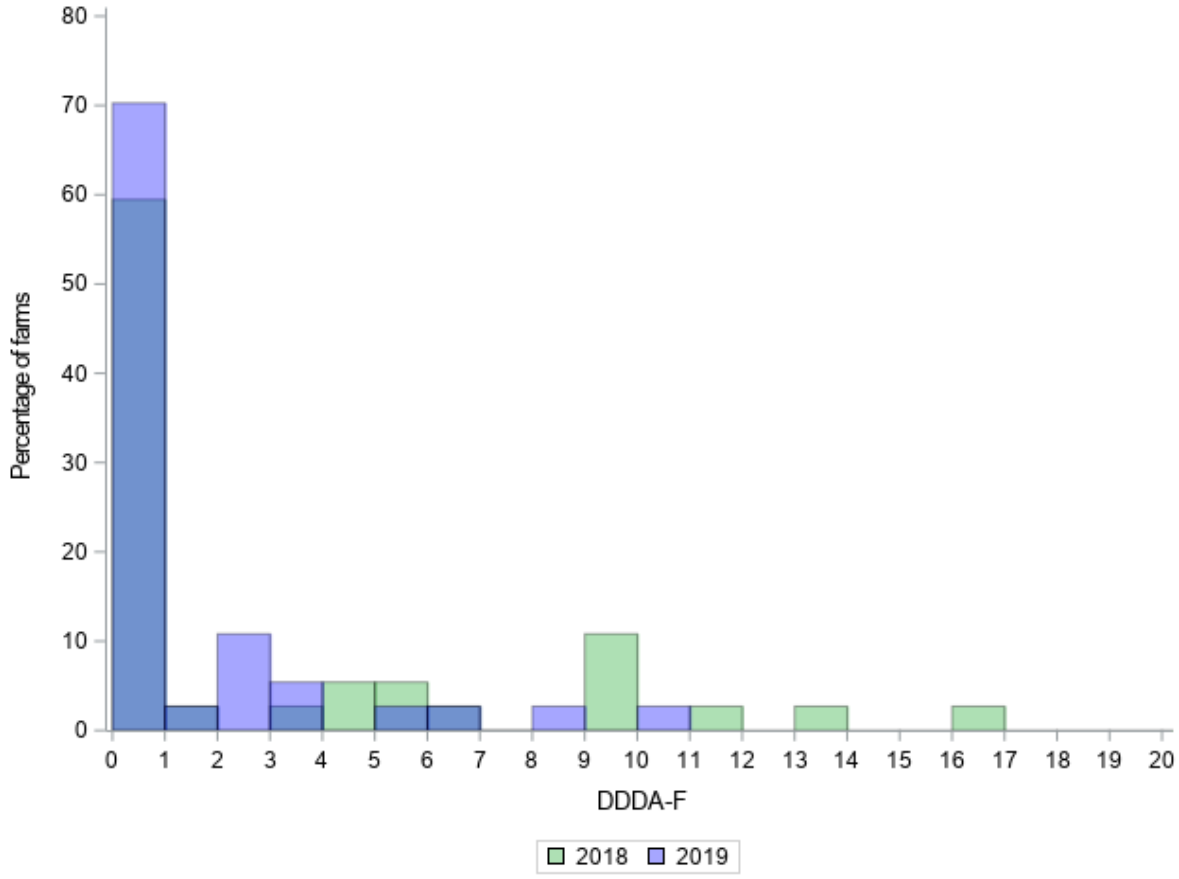


Table A19. Antibiotic use in $DDDA_F$ at parent stock production farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	35	0.00	0.00	0.60
1st choice	Tetracyclines	Oral	35	0.00	0.00	1.67
1st choice	Trimethoprim/sulfonamides	Oral	41	0.00	0.00	0.26
2nd choice	Aminopenicillins	Oral	42	0.00	0.00	0.08
2nd choice	Quinolones	Oral	40	0.00	0.00	0.41
2nd choice	Macrolides/lincosamides	Oral	33	0.00	0.00	0.67
3rd choice	Fluoroquinolones	Oral	42	0.00	0.00	0.20
3rd choice	Polymyxins	Oral	39	0.00	0.00	0.28

1.5 Grandparent stock rearing farms

Number of grandparent stock rearing farms: 3
Number of grandparent stock rearing farms with $DDDA_F$=0: 3 (100%)
Number of grandparent stock rearing farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of grandparent stock rearing farms that used fluoroquinolones: 0 (0.0%)
Number of grandparent stock rearing farms that used polymyxins: 0 (0.0%)

Table A20. Antibiotic use in $DDDA_F$ at grandparent stock rearing farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	3	0.0	0.0	0.0	0.0
2018	2	0.0	0.0	0.0	0.0
2019	3	0.0	0.0	0.0	0.0

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

1.6 Grandparent stock production farms

Number of grandparent stock production farms: 8
Number of grandparent stock production farms with $DDDA_F$=0: 7 (87.5%)
Number of grandparent stock production farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of grandparent stock production farms that used fluoroquinolones: 0 (0.0%)
Number of grandparent stock production farms that used polymyxins: 0 (0.0%)

Table A21. Antibiotic use in $DDDA_F$ at grandparent stock production farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	7	0.9	0.0	2.6	3.6
2018	6	0.6	0.0	0.0	3.4
2019	8	0.2	0.0	0.0	1.5

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Table A22. Antibiotic use in $DDDA_F$ at grandparent stock production farms in 2019, by pharmacotherapeutic group and route of administration

				$DDDA_F$		
Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	Median	P75	Mean
1st choice	Penicillins	Oral	7	0.00	0.00	0.18

Broiler parent/grandparent stock farming sector

1. Antibiotic use in $DDDA_F$

1.1 Parent stock rearing farms

Number of parent stock rearing farms: 91
Number of parent stock rearing farms with $DDDA_F$=0: 9 (9.9%)
Number of parent stock rearing farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of parent stock rearing farms that used fluoroquinolones: 8 (8.8%)
Number of parent stock rearing farms that used polymyxins: 0 (0.0%)

Table A23. Antibiotic use in $DDDA_F$ at parent stock rearing farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	104	14.3	9.1	18.2	29.9
2018	89	16.9	12.2	23.9	36.4
2019	91	15.4	11.3	20.5	31.1

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A14. 2018 and 2019 $DDDA_F$ distributions for parent stock rearing farms

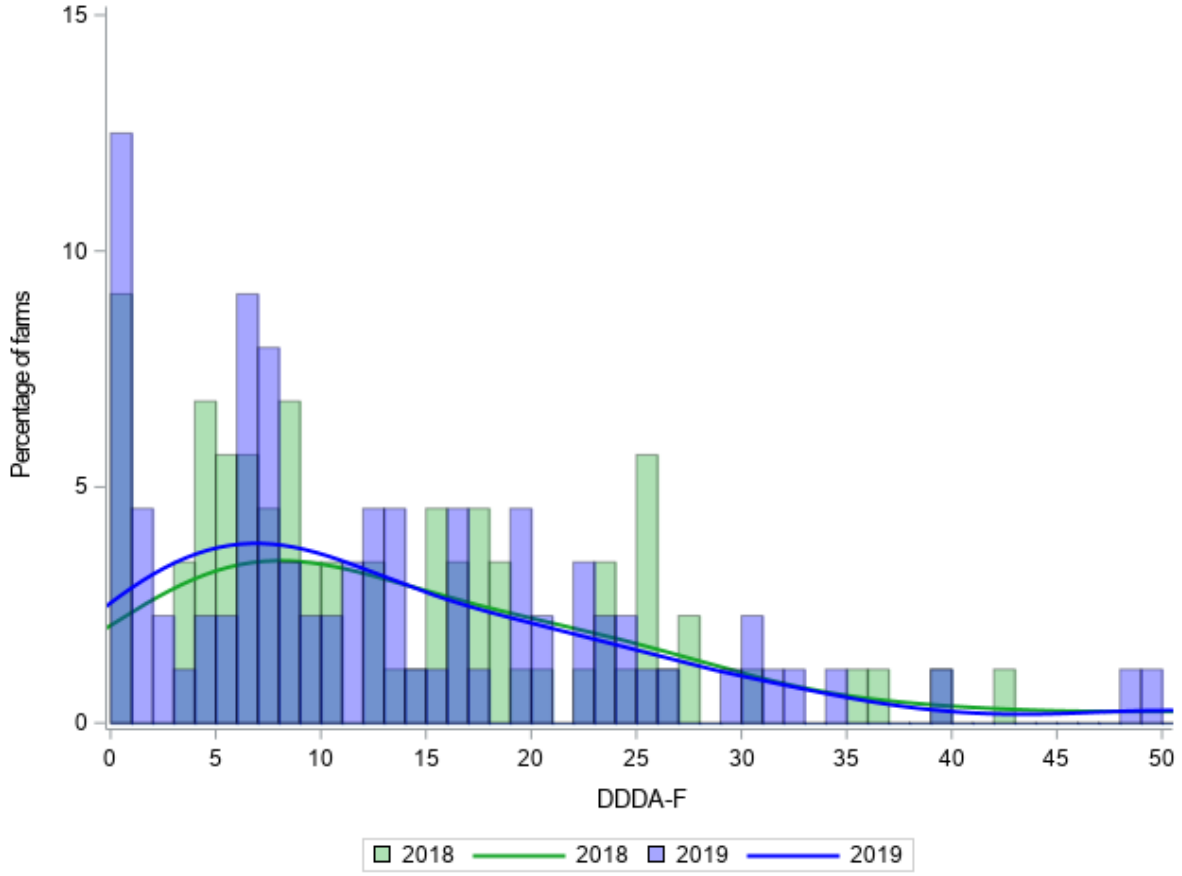


Table A24. Antibiotic use in $DDDA_F$ at parent stock rearing farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	48	0.00	5.28	3.28
1st choice	Tetracyclines	Oral	71	0.00	0.00	1.40
1st choice	Trimethoprim/sulfonamides	Oral	26	2.92	6.32	4.45
2nd choice	Aminopenicillins	Oral	51	0.00	6.17	3.79
2nd choice	Quinolones	Oral	75	0.00	0.00	1.92
2nd choice	Macrolides/lincosamides	Oral	89	0.00	0.00	0.02
3rd choice	Fluoroquinolones	Oral	83	0.00	0.00	0.49

1.2 Parent stock production farms

Number of parent stock production farms: 204
Number of parent stock production farms with $DDDA_F$=0: 148 (72.5%)
Number of parent stock production farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of parent stock production farms that used fluoroquinolones: 10 (4.9%)
Number of parent stock production farms that used polymyxins: 4 (2.0%)

Table A25. Antibiotic use in $DDDA_F$ at parent stock production farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	230	2.6	0.0	3.4	9.0
2018	196	2.7	0.0	3.8	8.4
2019	204	1.7	0.0	1.0	6.7

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A15. 2018 and 2019 $DDDA_F$ distributions for parent stock production farms

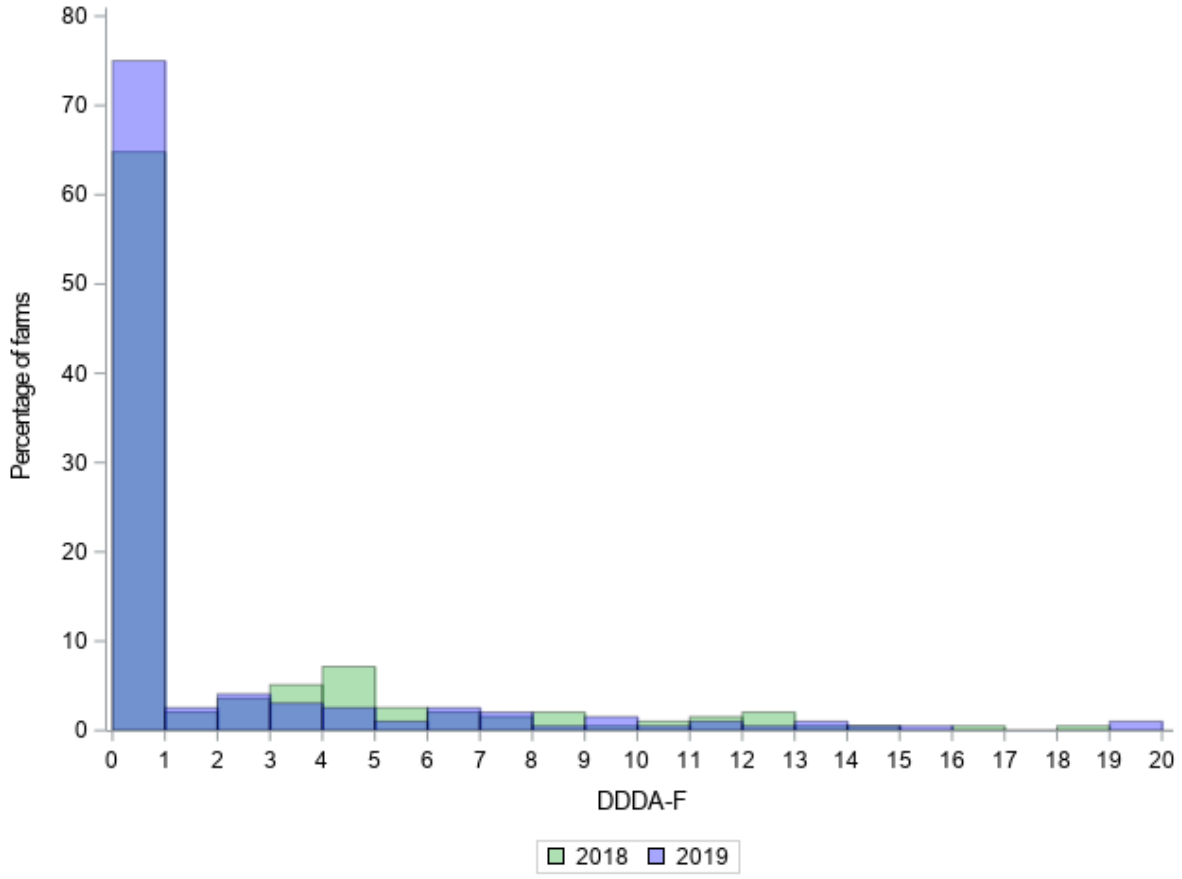


Table A26. Antibiotic use in $DDDA_F$ at parent stock production farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	198	0.00	0.00	0.07
1st choice	Tetracyclines	Oral	168	0.00	0.00	0.88
1st choice	Trimethoprim/sulfonamides	Oral	197	0.00	0.00	0.06
2st choice	Quinolones	Oral	188	0.00	0.00	0.38
2st choice	Aminopenicillins	Oral	202	0.00	0.00	0.04
2st choice	Macrolides/lincosamides	Oral	200	0.00	0.00	0.01
3rd choice	Fluoroquinolones	Oral	194	0.00	0.00	0.12
3rd choice	Polymyxins	Oral	200	0.00	0.00	0.10

1.3 Grandparent stock rearing farms

Number of grandparent stock rearing farms: 12
Number of grandparent stock rearing farms with $DDDA_F$=0: 3 (25.0%)
Number of grandparent stock rearing farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of grandparent stock rearing farms that used fluoroquinolones: 1 (8.3%)
Number of grandparent stock rearing farms that used polymyxins: 0 (0.0%)

Table A27. Antibiotic use in $DDDA_F$ at grandparent stock rearing farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	12	3.9	1.0	7.8	11.1
2018	10	5.7	5.6	11.7	12.8
2019	12	8.3	7.4	16.0	16.4

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Table A28. Antibiotic use in $DDDA_F$ at grandparent stock rearing farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Penicillins	Oral	6	0.71	2.94	1.86
1st choice	Tetracyclines	Oral	7	0.00	11.11	4.82
1st choice	Trimethoprim/sulfonamides	Oral	9	0.00	0.91	0.92
2nd choice	Aminopenicillins	Oral	10	0.00	0.00	0.46
3rd choice	Fluoroquinolones	Oral	11	0.00	0.00	0.24

1.4 Grandparent stock production farms

Number of grandparent stock production farms: 20
Number of grandparent stock production farms with $DDDA_F$=0: 12 (60.0%)
Number of grandparent stock production farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of grandparent stock production farms that used fluoroquinolones: 0 (0.0%)
Number of grandparent stock production farms that used polymyxins: 0 (0.0%)

Table A29. Antibiotic use in $DDDA_F$ at grandparent stock production farms from 2017 to 2019*

Year	N	Mean	Median	P75	P90
2017	20	5.2	3.1	7.7	16.8
2018	19	3.0	0.0	7.1	9.4
2019	20	5.3	0.0	8.8	20.1

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

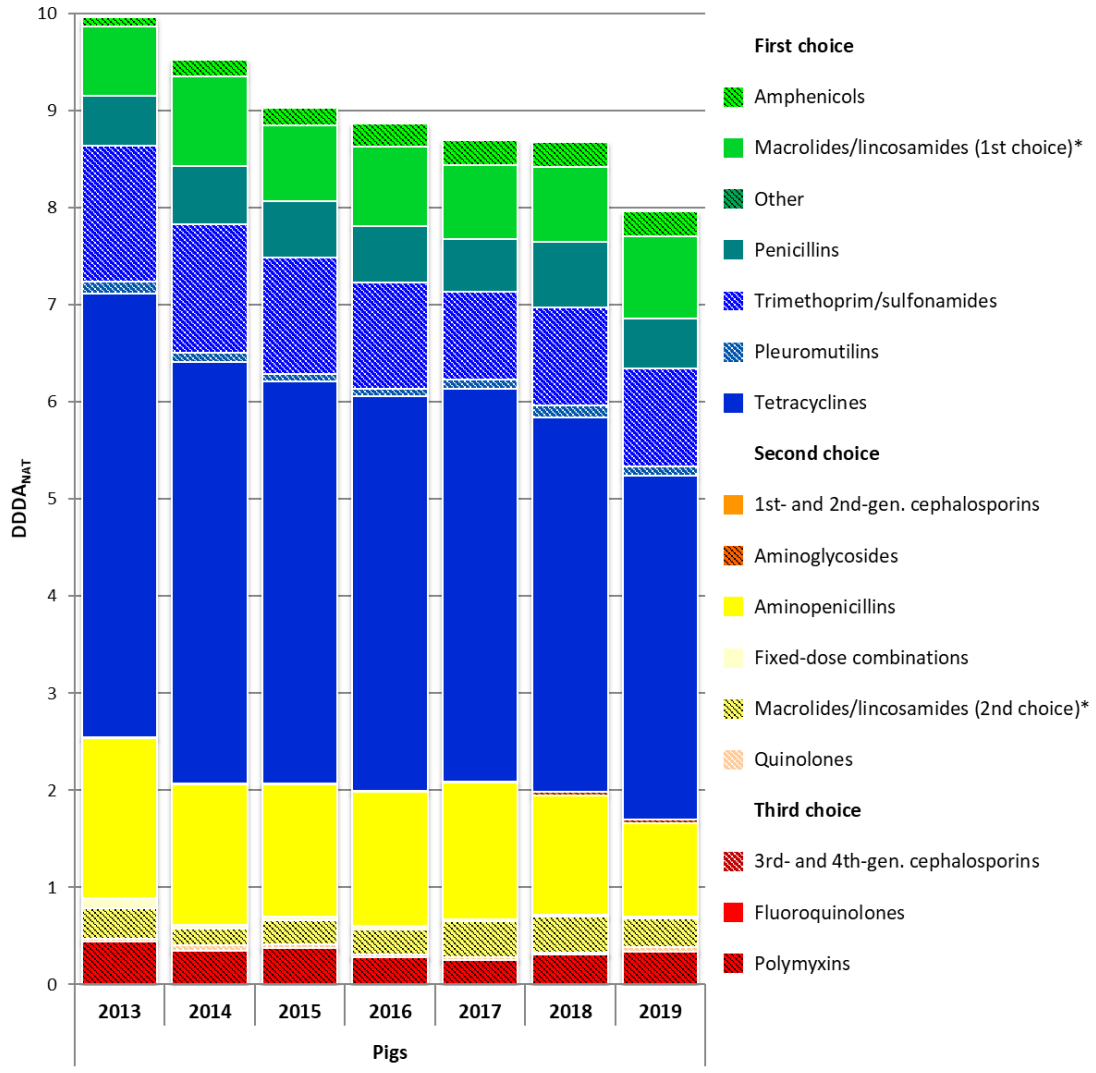
Table A30. Antibiotic use in $DDDA_F$ at grandparent stock production farms in 2019, by pharmacotherapeutic group and route of administration

				$DDDA_F$		
Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	Median	P75	Mean
1st choice	Penicillins	Oral	18	0.00	0.00	0.28
1st choice	Tetracyclines	Oral	15	0.00	2.62	2.21
1st choice	Trimethoprim/sulfonamides	Oral	17	0.00	0.00	1.00
2nd choice	Quinolones	Oral	18	0.00	0.00	0.54
2nd choice	Macrolides/lincosamides	Oral	19	0.00	0.00	1.24

Pig farming sector

1. Antibiotic use in $DDDA_{NAT}$

Figure A16. $DDDA_{NAT}$ trends in the pig farming sector over the 2013-2019 period, by pharmacotherapeutic group



* In the poultry farming sector, all macrolides/lincosamides (with the exception of lincomycin and spiramycin) are categorized as second-choice antibiotics. In other livestock sectors, only long-acting macrolides are categorized as second-choice antibiotics.

2. Antibiotic use in $DDDA_F$

2.1 Farms with sows and suckling piglets

Number of farms with sows and suckling piglets: 1,659
Number of farms with sows and suckling piglets with $DDDA_F$=0: 94 (5.7%)
Number of farms with sows and suckling piglets that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of farms with sows and suckling piglets that used fluoroquinolones: 5 (0.3%)
Number of farms with sows and suckling piglets that used polymyxins: 480 (28.9%)

Table A31. Antibiotic use in $DDDA_F$ at farms with sows and suckling piglets from 2015 to 2019*

Year	N	Mean	Median	P75	P90
2015	2,109	5.4	3.1	6.8	12.8
2016	1,919	3.5	2.3	4.7	8.1
2017	1,853	3.7	2.2	4.7	8.2
2018	1,780	3.8	2.1	4.5	8.6
2019	1,659	3.5	2.1	4.6	8.2

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A17. 2015, 2018 and 2019 $DDDA_F$ distributions for farms with sows and suckling piglets

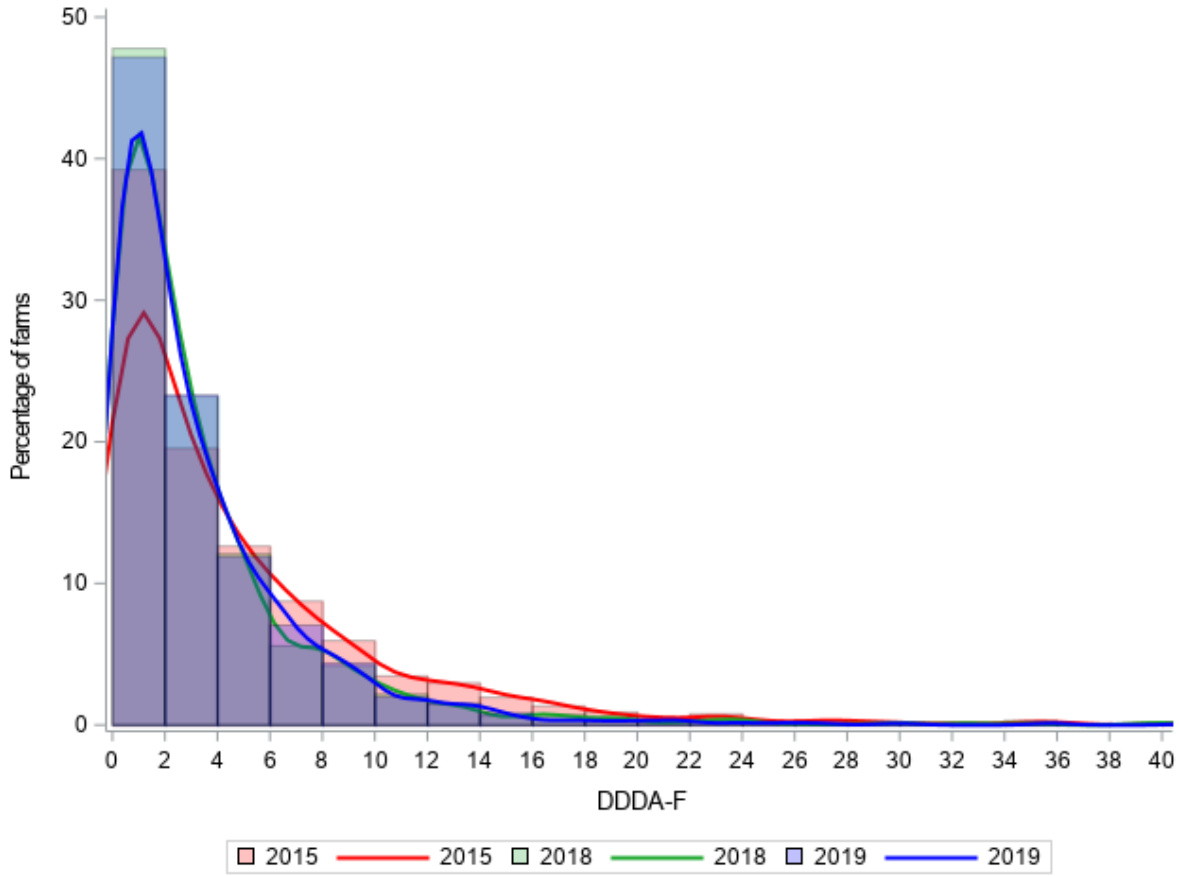
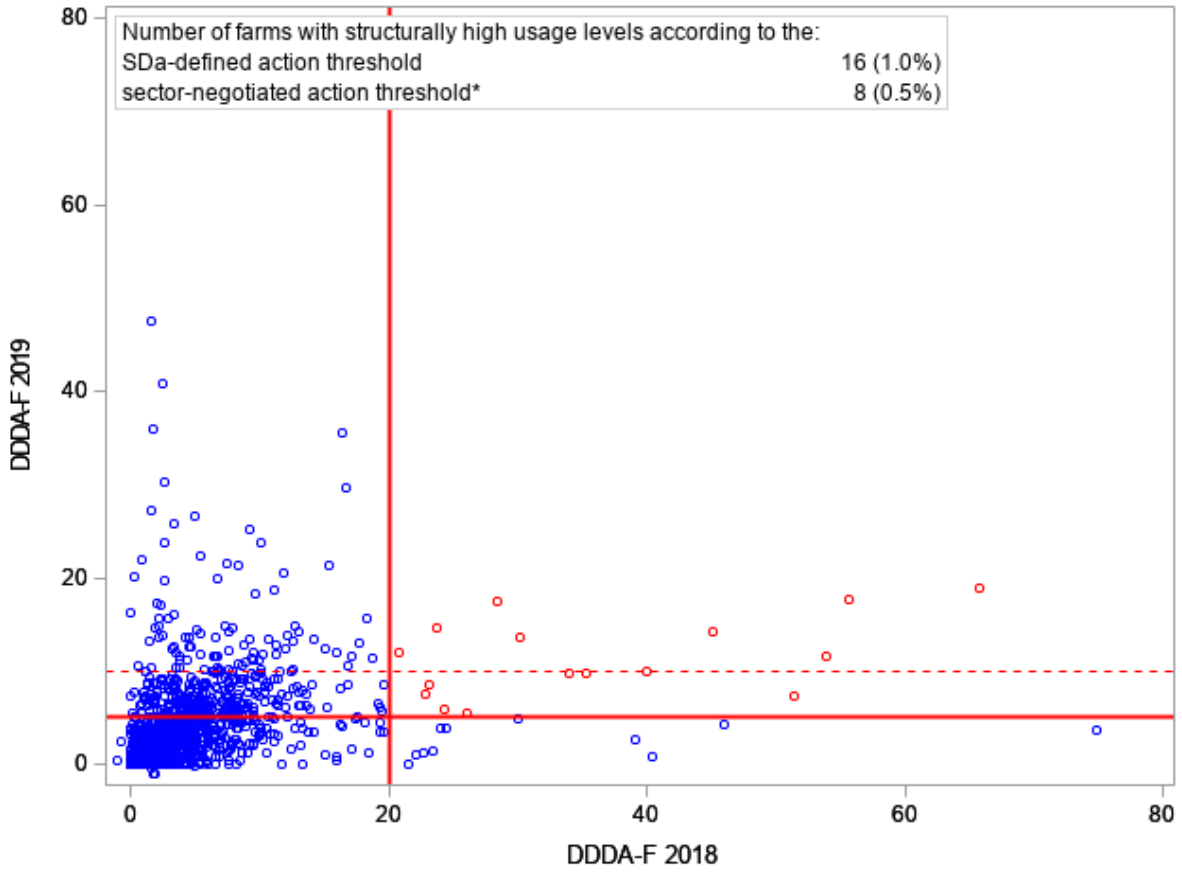


Figure A18. Scatter plot of 2018 and 2019 $DDDA_F$ values for farms with sows and suckling piglets. The red solid lines represent the action thresholds defined by the SDa. The red dotted line represents the transitional action threshold negotiated by the livestock sector. For each type of action threshold, the number of farms with structurally high usage levels is listed in the upper-left corner of the scatter plot



* The transitional action threshold agreed upon by the livestock sector and the Ministry of Agriculture, Nature and Food Quality only applies to the 2019 data. The SDa's former action threshold was used to determine which farms recorded high usage levels for 2018.

Table A32. Antibiotic use in $DDDA_F$ at farms with sows and suckling piglets in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	1,168	0.00	0.09	0.19
1st choice	Macrolides/lincosamides	Oral	1,527	0.00	0.00	0.14
1st choice	Macrolides/lincosamides	Parenteral	1,459	0.00	0.00	0.02
1st choice	Penicillins	Oral	1,658	0.00	0.00	0.00
1st choice	Penicillins	Parenteral	287	0.41	1.10	0.79
1st choice	Pleuromutilins	Oral	1,640	0.00	0.00	0.04
1st choice	Pleuromutilins	Parenteral	1,609	0.00	0.00	0.00
1st choice	Tetracyclines	Oral	1,279	0.00	0.00	0.66
1st choice	Tetracyclines	Parenteral	715	0.05	0.36	0.42
1st choice	Trimethoprim/sulfonamides	Oral	1,385	0.00	0.00	0.24
1st choice	Trimethoprim/sulfonamides	Parenteral	656	0.05	0.28	0.25
2nd choice	Aminoglycosides	Oral	1,582	0.00	0.00	0.01
2nd choice	Aminopenicillins	Oral	1,536	0.00	0.00	0.09
2nd choice	Aminopenicillins	Parenteral	890	0.00	0.24	0.20
2nd choice	Quinolones	Oral	1,637	0.00	0.00	0.04
2nd choice	Fixed-dose combinations	Parenteral	1,490	0.00	0.00	0.03
2nd choice	Macrolides/lincosamides	Parenteral	1,317	0.00	0.00	0.28
3rd choice	Fluoroquinolones	Parenteral	1,654	0.00	0.00	0.00
3rd choice	Polymyxins	Oral	1,518	0.00	0.00	0.06
3rd choice	Polymyxins	Parenteral	1,229	0.00	0.01	0.04

2.2 Farms with weaner pigs

Number of farms with weaner pigs: 1,833
Number of farms with weaner pigs with $DDDA_F$=0: 276 (15.1%)
Number of farms with weaner pigs that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of farms with weaner pigs that used fluoroquinolones: 3 (0.2%)
Number of farms with weaner pigs that used polymyxins: 512 (27.9%)

Table A33. Antibiotic use in $DDDA_F$ at farms with weaner pigs from 2015 to 2019*

Year	N	Mean	Median	P75	P90
2015	2,276	19.6	7.6	24.4	52.2
2016	2,088	24.2	11.9	29.1	57.2
2017	2,037	21.7	10.6	25.5	52.9
2018	1,941	19.8	10.1	23.5	44.0
2019	1,833	16.8	8.1	20.7	38.3

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A19. 2015, 2018 and 2019 $DDDA_F$ distributions for farms with weaner pigs

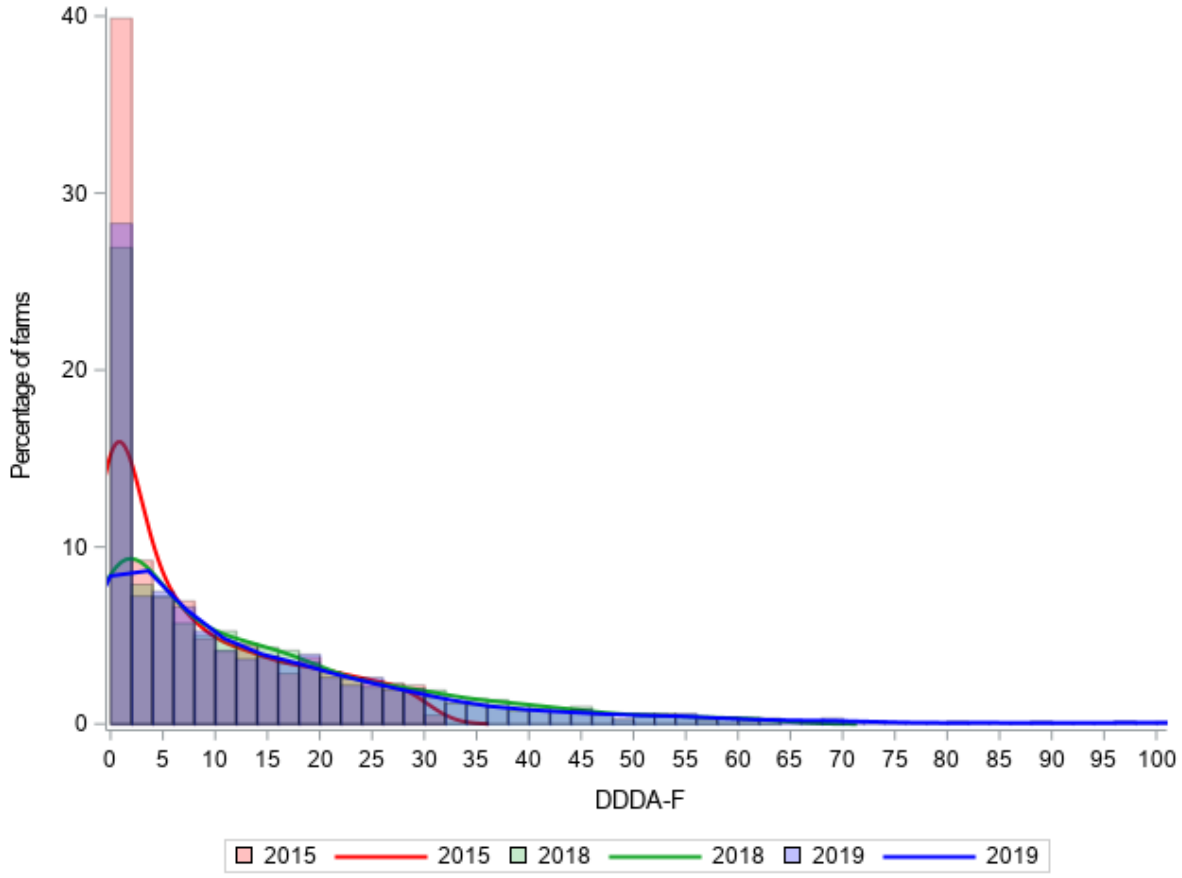


Figure A20. Scatter plot of 2018 and 2019 $DDDA_F$ values for farms with weaner pigs. The red solid lines represent the action thresholds defined by the SDa. The number of farms with structurally high usage levels (farms whose usage levels exceeded the action threshold in both years) is listed in the upper-right corner of the scatter plot

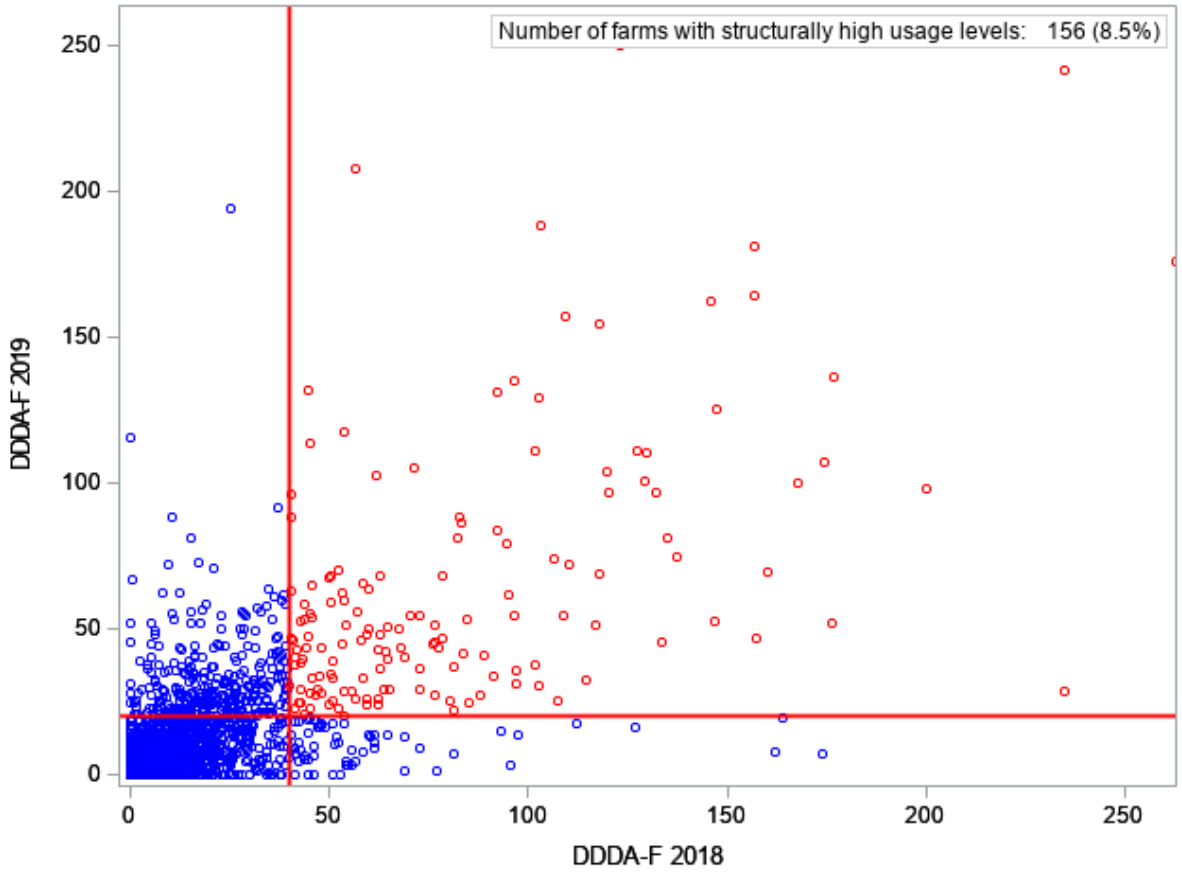


Table A34. Antibiotic use in $DDDA_F$ at farms with weaner pigs in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Oral	1,830	0.00	0.00	0.01
1st choice	Amphenicols	Parenteral	1,487	0.00	0.00	0.31
1st choice	Macrolides/lincosamides	Oral	1,622	0.00	0.00	0.51
1st choice	Macrolides/lincosamides	Parenteral	1,763	0.00	0.00	0.02
1st choice	Penicillins	Oral	1,830	0.00	0.00	0.00
1st choice	Penicillins	Parenteral	1,049	0.00	0.50	0.58
1st choice	Pleuromutilins	Oral	1,810	0.00	0.00	0.18
1st choice	Pleuromutilins	Parenteral	1,812	0.00	0.00	0.01
1st choice	Tetracyclines	Oral	1,036	0.00	6.38	5.76
1st choice	Tetracyclines	Parenteral	1,361	0.00	0.05	0.46
1st choice	Trimethoprim/sulfonamides	Oral	1,158	0.00	2.06	2.60
1st choice	Trimethoprim/sulfonamides	Parenteral	1,590	0.00	0.00	0.06
2nd choice	Aminopenicillins	Oral	1,374	0.00	0.00	3.39
2nd choice	Aminopenicillins	Parenteral	1,179	0.00	0.27	0.45
2nd choice	Aminoglycosides	Oral	1,764	0.00	0.00	0.18
2nd choice	Quinolones	Oral	1,813	0.00	0.00	0.04
2nd choice	Fixed-dose combinations	Parenteral	1,720	0.00	0.00	0.02
2nd choice	Macrolides/lincosamides	Parenteral	1,522	0.00	0.00	0.84
3rd choice	Fluoroquinolones	Parenteral	1,830	0.00	0.00	0.00
3rd choice	Polymyxins	Oral	1,463	0.00	0.00	1.24
3rd choice	Polymyxins	Parenteral	1,523	0.00	0.00	0.09

2.3 Farms with fattening pigs

Number of farms with fattening pigs: 4,005
Number of farms with fattening pigs with $DDDA_F$=0: 973 (24.3%)
Number of farms with fattening pigs that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of farms with fattening pigs that used fluoroquinolones: 0 (0.0%)
Number of farms with fattening pigs that used polymyxins: 145 (3.6%)

Table A35. Antibiotic use in $DDDA_F$ at farms with fattening pigs from 2015 to 2019*

Year	N	Mean	Median	P75	P90
2015	5,072	4.1	1.6	5.4	10.2
2016	4,701	4.0	1.7	5.7	10.1
2017	4,580	3.8	1.7	5.4	9.8
2018	4,323	3.9	1.8	5.4	9.9
2019	4,005	3.8	1.6	5.5	10.2

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A21. 2015, 2018 and 2019 $DDDA_F$ distributions for farms with fattening pigs

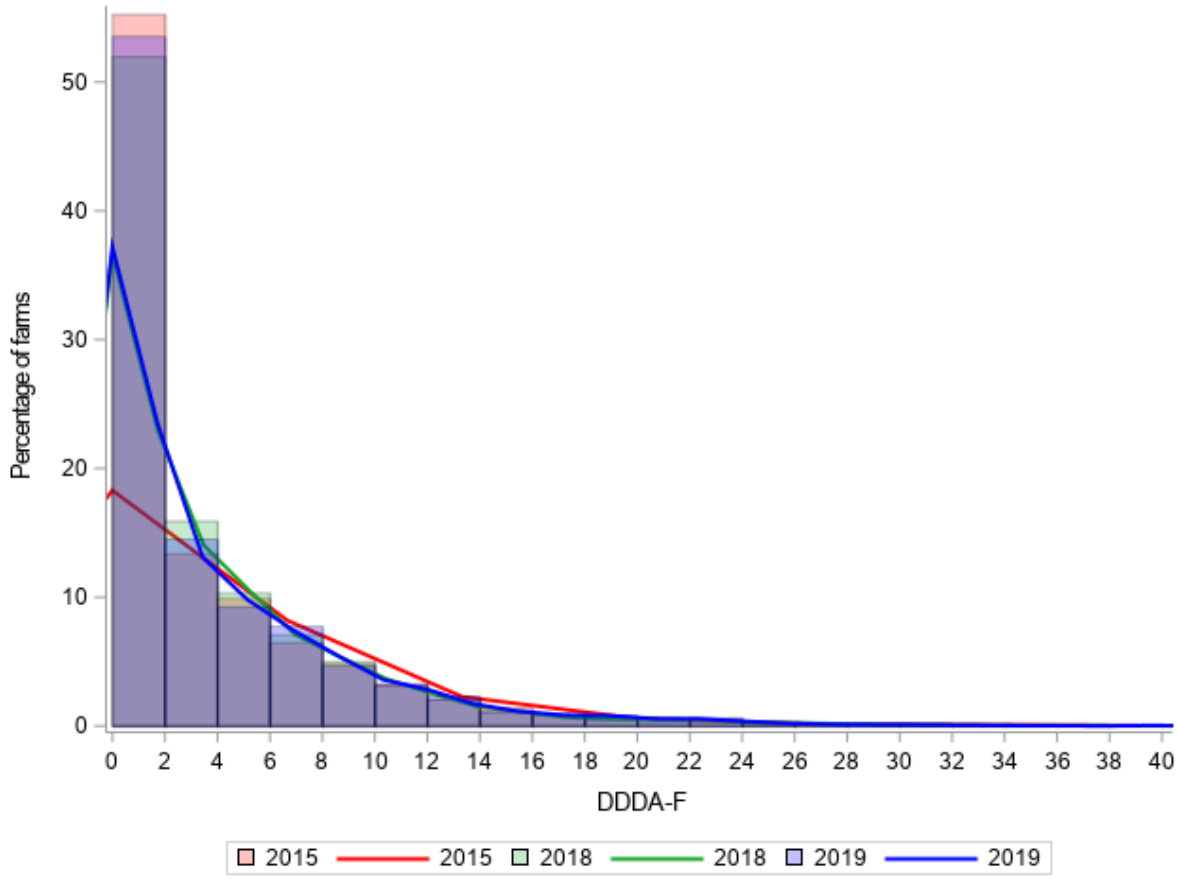
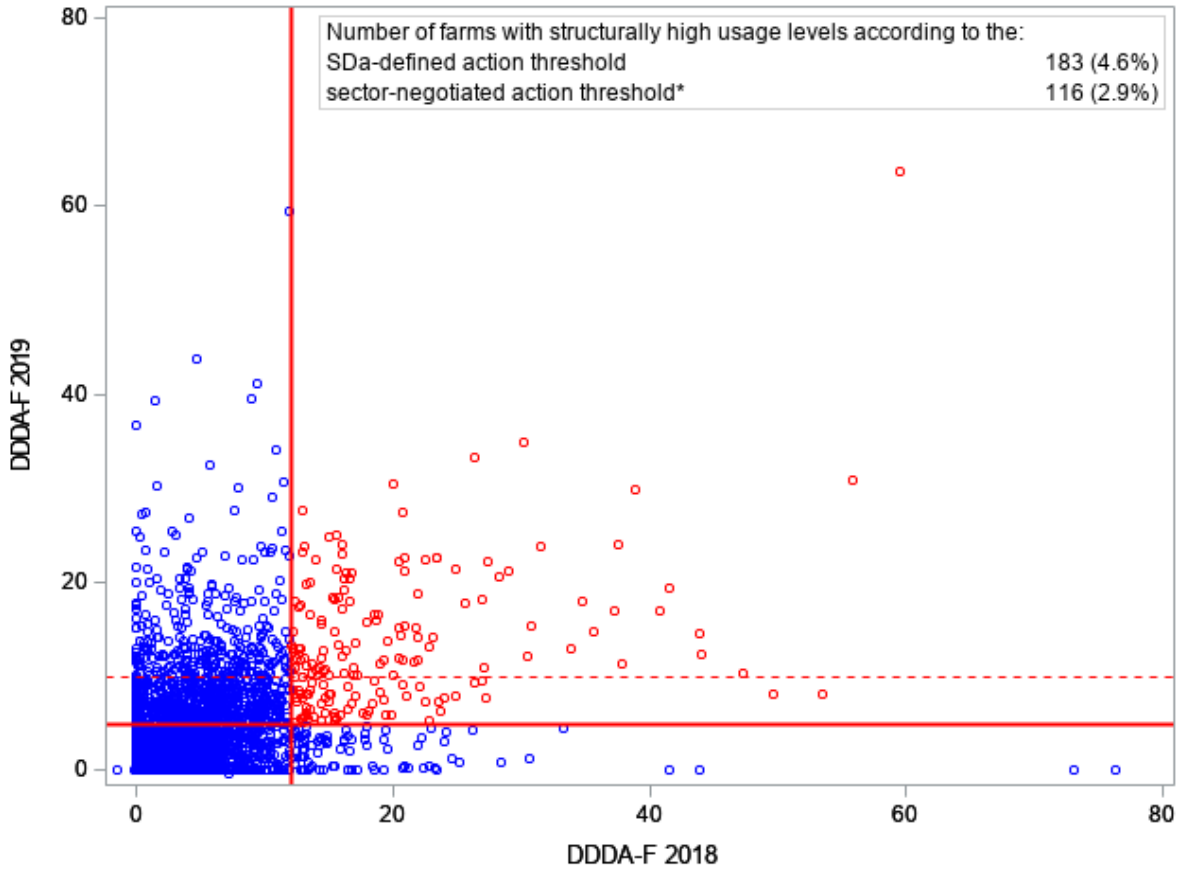


Figure A22. Scatter plot of 2018 and 2019 $DDDA_F$ values for farms with fattening pigs. The red solid lines represent the action thresholds defined by the SDa. The red dotted line represents the transitional action threshold negotiated by the livestock sector. For each type of action threshold, the number of farms with structurally high usage levels is listed in the upper-right corner of the scatter plot



* The transitional action threshold agreed upon by the livestock sector and the Ministry of Agriculture, Nature and Food Quality only applies to the 2019 data. The SDa's former action threshold was used to determine which farms recorded high usage levels for 2018.

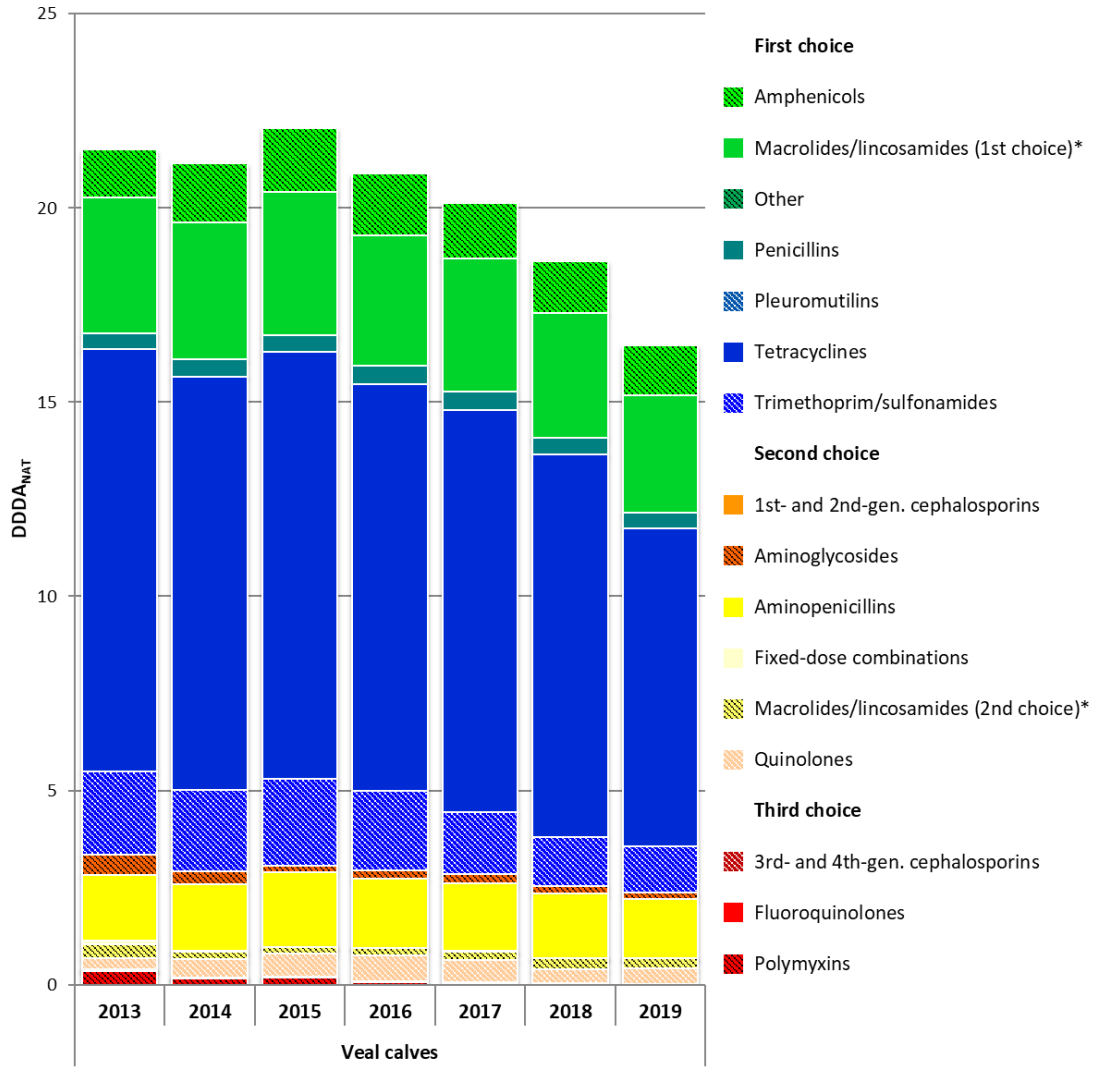
Table A36. Antibiotic use in $DDDA_F$ at farms with fattening pigs in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Oral	4,003	0.00	0.00	0.00
1st choice	Amphenicols	Parenteral	2,917	0.00	0.05	0.17
1st choice	Macrolides/lincosamides	Oral	2,939	0.00	0.32	0.82
1st choice	Macrolides/lincosamides	Parenteral	3,218	0.00	0.00	0.03
1st choice	Penicillins	Parenteral	1,625	0.06	0.30	0.27
1st choice	Pleuromutilins	Oral	3,914	0.00	0.00	0.05
1st choice	Pleuromutilins	Parenteral	3,872	0.00	0.00	0.00
1st choice	Tetracyclines	Oral	2,399	0.00	2.11	1.72
1st choice	Tetracyclines	Parenteral	2,272	0.00	0.16	0.20
1st choice	Trimethoprim/sulfonamides	Oral	3,202	0.00	0.00	0.43
1st choice	Trimethoprim/sulfonamides	Parenteral	3,942	0.00	0.00	0.00
2nd choice	Aminoglycosides	Oral	3,997	0.00	0.00	0.00
2nd choice	Aminopenicillins	Intramammary	4,004	0.00	0.00	0.00
2nd choice	Aminopenicillins	Oral	3,876	0.00	0.00	0.06
2nd choice	Aminopenicillins	Parenteral	3,555	0.00	0.00	0.01
2nd choice	Quinolones	Oral	3,992	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Parenteral	3,916	0.00	0.00	0.00
2nd choice	Macrolides/lincosamides	Parenteral	3,936	0.00	0.00	0.02
3rd choice	Polymyxins	Oral	3,925	0.00	0.00	0.02
3rd choice	Polymyxins	Parenteral	3,920	0.00	0.00	0.00

Veal farming sector

1. Antibiotic use in $DDDA_{NAT}$

Figure A23. $DDDA_{NAT}$ trends in the veal farming sector over the 2013-2019 period, by pharmacotherapeutic group



* In the poultry farming sector, all macrolides/lincosamides (with the exception of lincomycin and spiramycin) are categorized as second-choice antibiotics. In other livestock sectors, only long-acting macrolides are categorized as second-choice antibiotics.

2. Antibiotic use in $DDDA_F$

2.1 White veal farms

Number of white veal farms: 823
Number of white veal farms with $DDDA_F$=0: 2 (0.2%)
Number of white veal farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of white veal farms that used fluoroquinolones: 90 (10.9%)
Number of white veal farms that used polymyxins: 62 (7.5%)

Table A37. Antibiotic use in $DDDA_F$ at white veal farms from 2011 to 2019*

Year	N	Mean	Median	P75	P90
2011	934	41.1	33.2	44.9	57.8
2012	904	33.6	30.7	40.1	50.9
2013	862	31.4	26.2	35.1	45.2
2014	864	24.5	23.4	31.0	37.8
2015	855	25.1	24.3	31.7	38.3
2016	857	23.7	23.0	29.0	35.6
2017	838	23.0	22.2	27.0	33.1
2018	855	20.1	19.3	24.6	30.0
2019	823	17.4	16.8	20.8	25.9

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A24. 2012, 2018 and 2019 $DDDA_F$ distributions for white veal farms

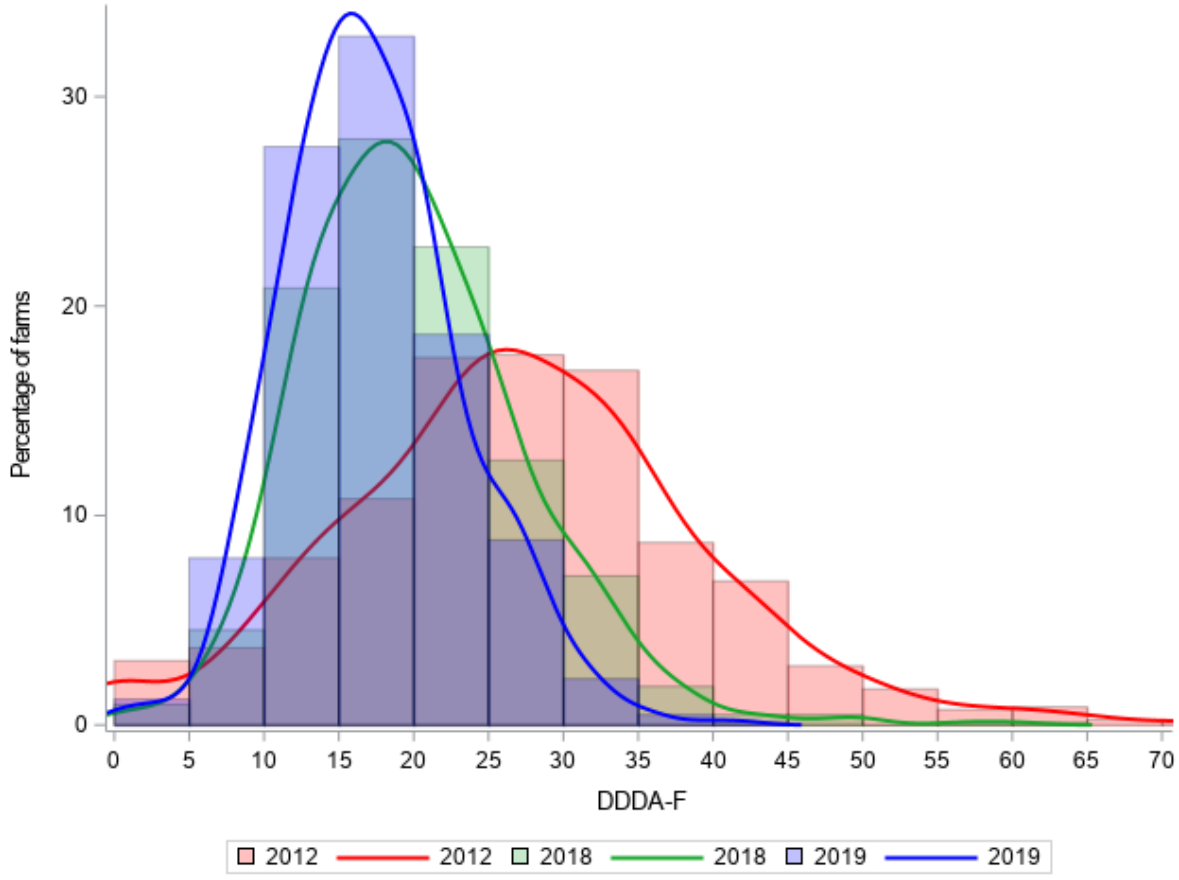


Figure A25. Scatter plot of 2018 and 2019 $DDDA_F$ values for white veal farms. The red solid lines represent the action thresholds defined by the SDa. The number of farms with structurally high usage levels (farms whose usage levels exceeded the action threshold in both years) is listed in the upper-left corner of the scatter plot

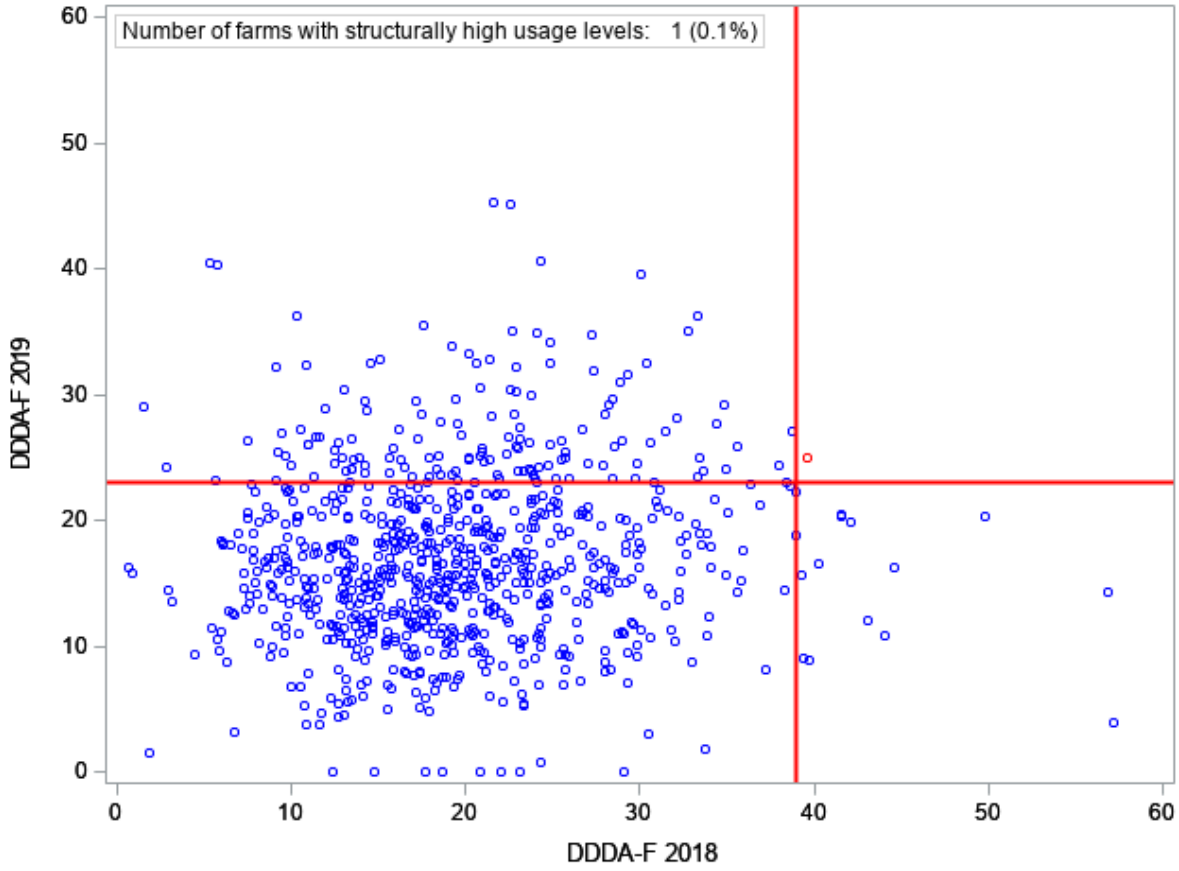


Table A38. Antibiotic use in $DDDA_F$ at white veal farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	7	0.75	1.20	0.91
1st choice	Macrolides/lincosamides	Oral	25	2.91	3.85	3.04
1st choice	Macrolides/lincosamides	Parenteral	257	0.02	0.08	0.11
1st choice	Penicillins	Parenteral	31	0.31	0.54	0.41
1st choice	Tetracyclines	Intrauterine	822	0.00	0.00	0.00
1st choice	Tetracyclines	Oral	3	8.57	11.14	9.06
1st choice	Tetracyclines	Parenteral	582	0.00	0.01	0.02
1st choice	Trimethoprim/sulfonamides	Oral	431	0.00	1.29	0.84
1st choice	Trimethoprim/sulfonamides	Parenteral	190	0.03	0.07	0.06
2nd choice	Aminoglycosides	Oral	285	0.02	0.05	0.11
2nd choice	Aminoglycosides	Parenteral	489	0.00	0.04	0.05
2nd choice	Aminopenicillins	Intramammary	822	0.00	0.00	0.00
2nd choice	Aminopenicillins	Oral	264	0.47	2.68	1.66
2nd choice	Aminopenicillins	Parenteral	123	0.07	0.14	0.10
2nd choice	Quinolones	Oral	622	0.00	0.00	0.47
2nd choice	Fixed-dose combinations	Parenteral	805	0.00	0.00	0.00
2nd choice	Macrolides/lincosamides	Parenteral	202	0.13	0.31	0.22
3rd choice	Fluoroquinolones	Oral	809	0.00	0.00	0.00
3rd choice	Fluoroquinolones	Parenteral	747	0.00	0.00	0.01
3rd choice	Polymyxins	Oral	810	0.00	0.00	0.01
3rd choice	Polymyxins	Parenteral	765	0.00	0.00	0.00

2.2 Rosé veal starter farms

Number of rosé veal starter farms: 210
Number of rosé veal starter farms with $DDDA_F$=0: 0 (0.0%)
Number of rosé veal starter farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of rosé veal starter farms that used fluoroquinolones: 18 (8.6%)
Number of rosé veal starter farms that used polymyxins: 5 (2.4%)

Table A39. Antibiotic use in $DDDA_F$ at rosé veal starter farms from 2011 to 2019*

Year	N	Mean	Median	P75	P90
2011	207	120.0	94.4	127.8	171.5
2012	189	97.5	84.2	107.1	143.1
2013	264	115.6	80.9	102.2	131.0
2014	260	79.6	77.7	97.2	113.9
2015	247	82.7	83.0	101.5	115.1
2016	240	83.9	83.2	100	111.6
2017	238	83.0	83.1	102.0	113.3
2018	256	79.9	79.3	96.1	115.6
2019	210	74.7	73.2	92.4	105.5

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A26. 2012, 2018 and 2019 $DDDA_F$ distributions for rosé veal starter farms

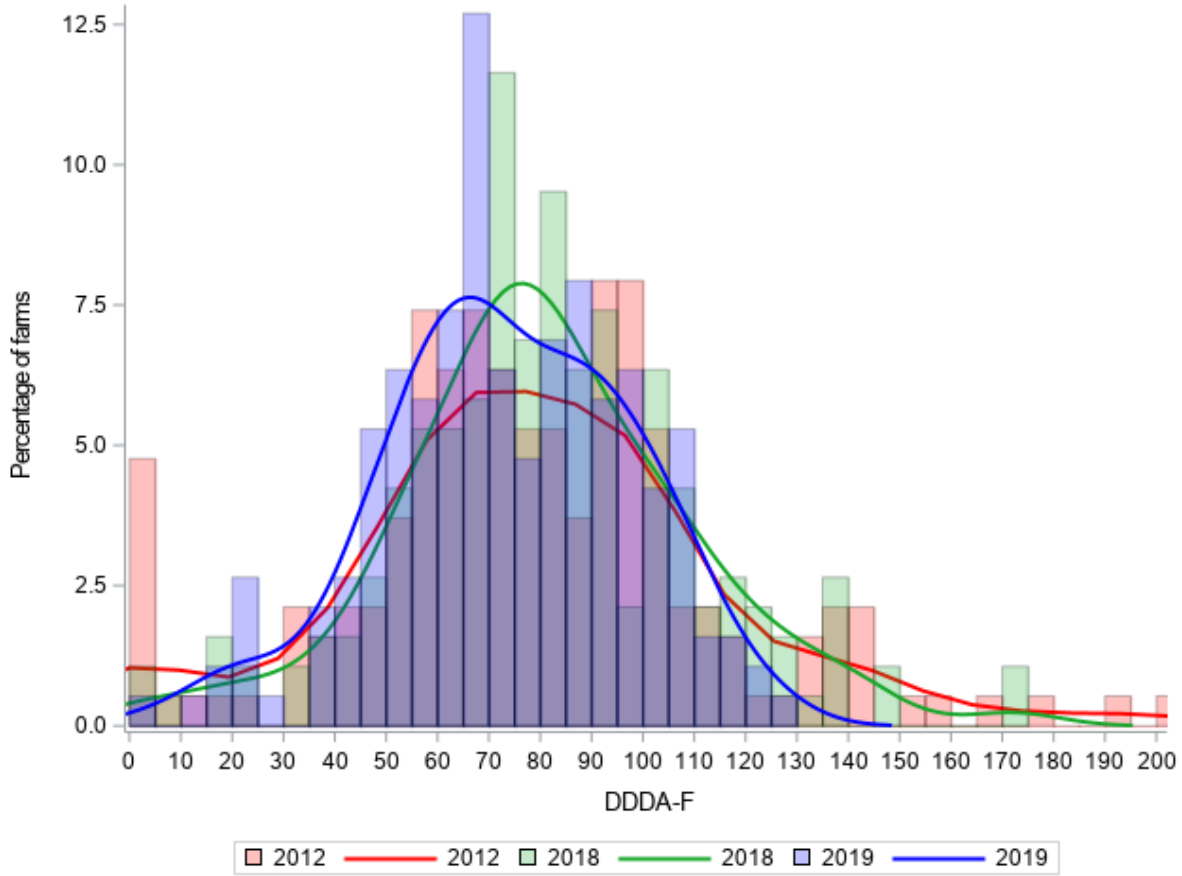


Figure A27. Scatter plot of 2018 and 2019 $DDDA_F$ values for rosé veal starter farms. The red solid lines represent the action thresholds defined by the SDa. The number of farms with structurally high usage levels (farms whose usage levels exceeded the action threshold in both years) is listed in the upper-left corner of the scatter plot

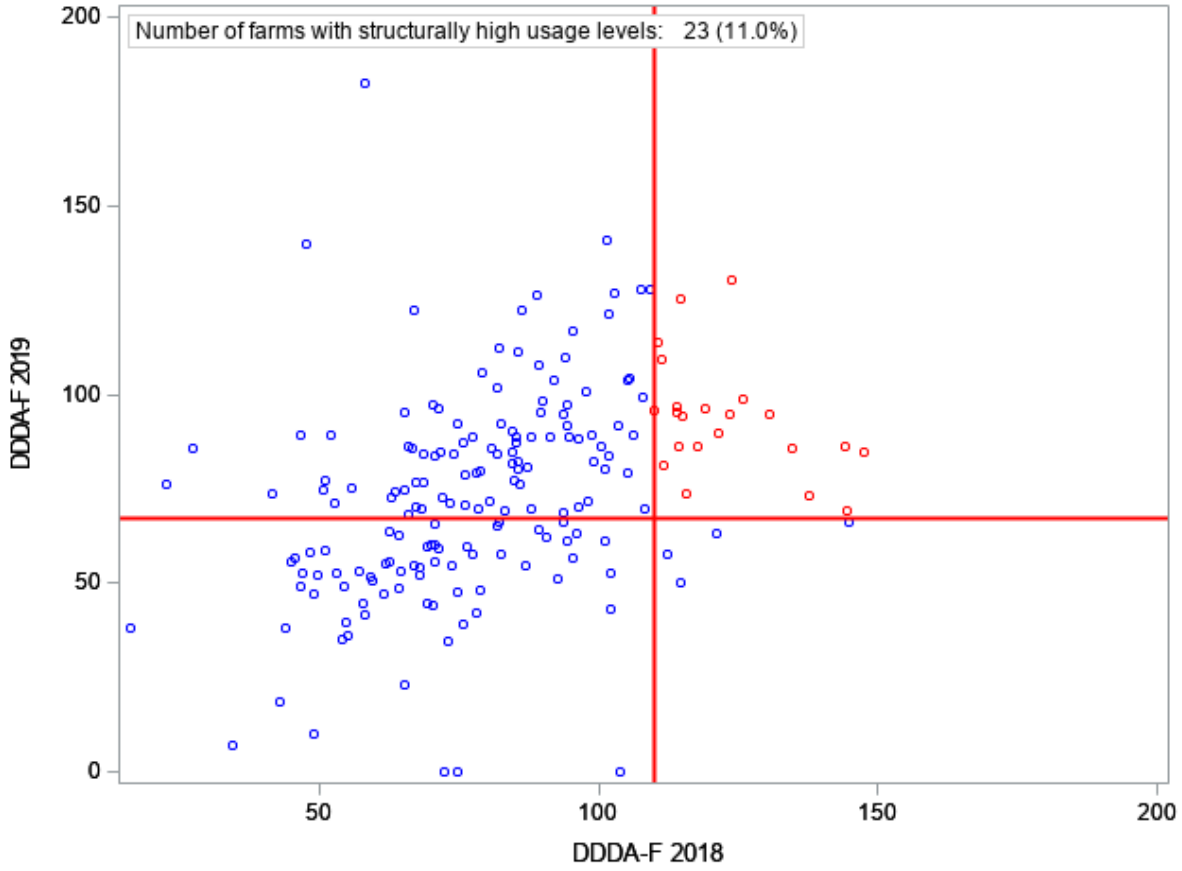


Table A40. Antibiotic use in $DDDA_F$ at rosé veal starter farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	0	5.38	8.55	6.80
1st choice	Macrolides/lincosamides	Oral	9	16.32	19.60	15.23
1st choice	Macrolides/lincosamides	Parenteral	52	0.16	0.46	0.61
1st choice	Penicillins	Parenteral	10	1.11	2.00	1.57
1st choice	Tetracyclines	Oral	2	38.20	48.26	38.12
1st choice	Tetracyclines	Parenteral	158	0.00	0.00	0.16
1st choice	Trimethoprim/sulfonamides	Oral	63	3.81	9.31	6.06
1st choice	Trimethoprim/sulfonamides	Parenteral	61	0.15	0.38	0.36
2nd choice	Aminoglycosides	Oral	124	0.00	0.20	0.52
2nd choice	Aminoglycosides	Parenteral	96	0.05	0.45	0.35
2nd choice	Aminopenicillins	Oral	109	0.00	4.16	2.53
2nd choice	Aminopenicillins	Parenteral	32	0.30	0.60	0.43
2nd choice	Quinolones	Oral	170	0.00	0.00	0.65
2nd choice	Fixed-dose combinations	Parenteral	206	0.00	0.00	0.00
2nd choice	Macrolides/lincosamides	Parenteral	64	0.53	1.73	1.21
3rd choice	Fluoroquinolones	Oral	206	0.00	0.00	0.01
3rd choice	Fluoroquinolones	Parenteral	196	0.00	0.00	0.02
3rd choice	Polymyxins	Oral	209	0.00	0.00	0.06
3rd choice	Polymyxins	Parenteral	205	0.00	0.00	0.00

2.3 Rosé veal fattening farms

Number of rosé veal fattening farms: 732
Number of rosé veal fattening farms with $DDDA_F$=0: 66 (9.0%)
Number of rosé veal fattening farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of rosé veal fattening farms that used fluoroquinolones: 10 (1.4%)
Number of rosé veal fattening farms that used polymyxins: 10 (1.4%)

Table A41. Antibiotic use in $DDDA_F$ at rosé veal fattening farms from 2011 to 2019*

Year	N	Mean	Median	P75	P90
2011	671	7.8	1.5	6.6	14.5
2012	717	5.8	2.3	7.3	15.5
2013	723	5.2	1.4	5.4	10.8
2014	663	3.4	1.2	4.5	9.5
2015	638	2.7	1.0	4.0	7.3
2016	602	2.8	0.9	3.9	8.1
2017	580	3.0	1.6	4.1	7.8
2018	601	2.7	1.2	3.8	6.4
2019	732	3.9	1.9	6.0	10.5

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A28. 2012, 2018 and 2019 $DDDA_F$ distributions for rosé veal fattening farms

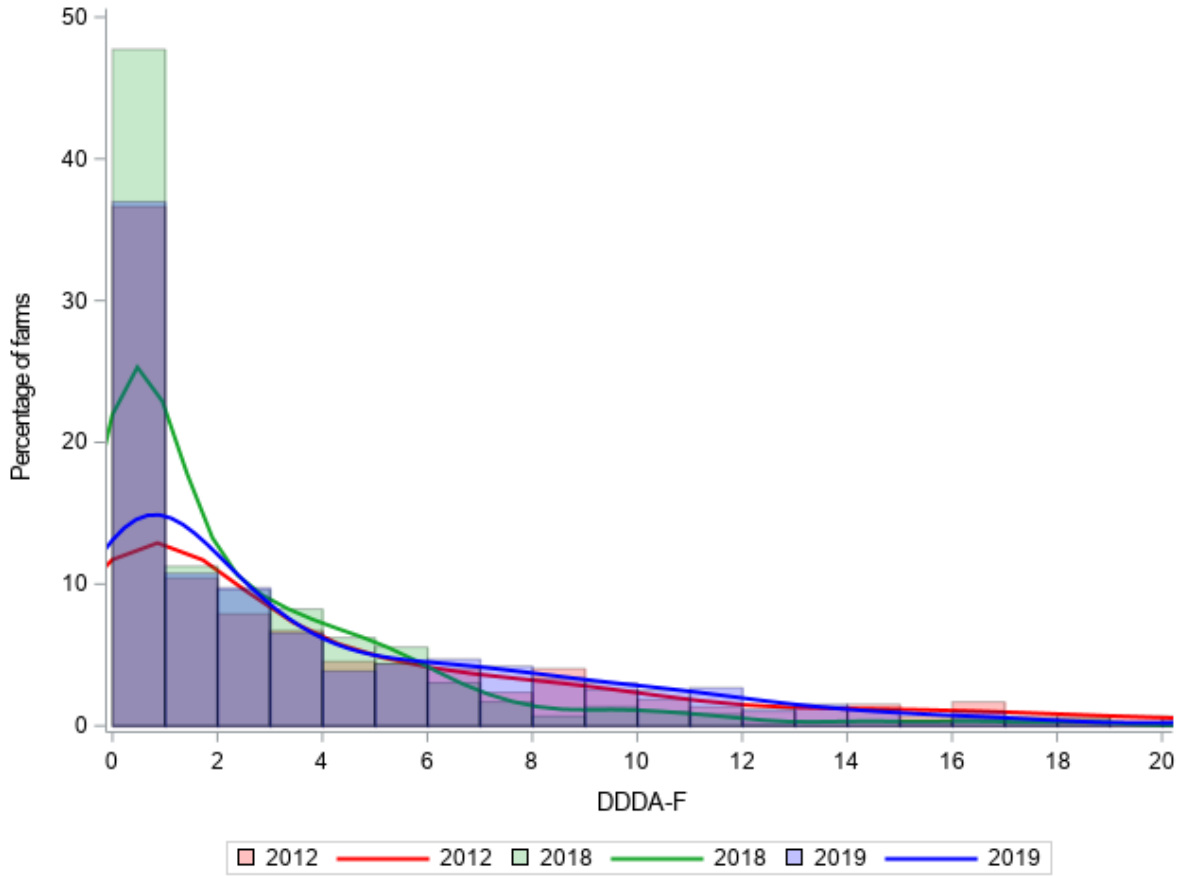


Figure A29. Scatter plot of 2018 and 2019 $DDDA_F$ values for rosé veal fattening farms. The red solid lines represent the action thresholds defined by the SDa. The number of farms with structurally high usage levels (farms whose usage levels exceeded the action threshold in both years) is listed in the upper-right corner of the scatter plot

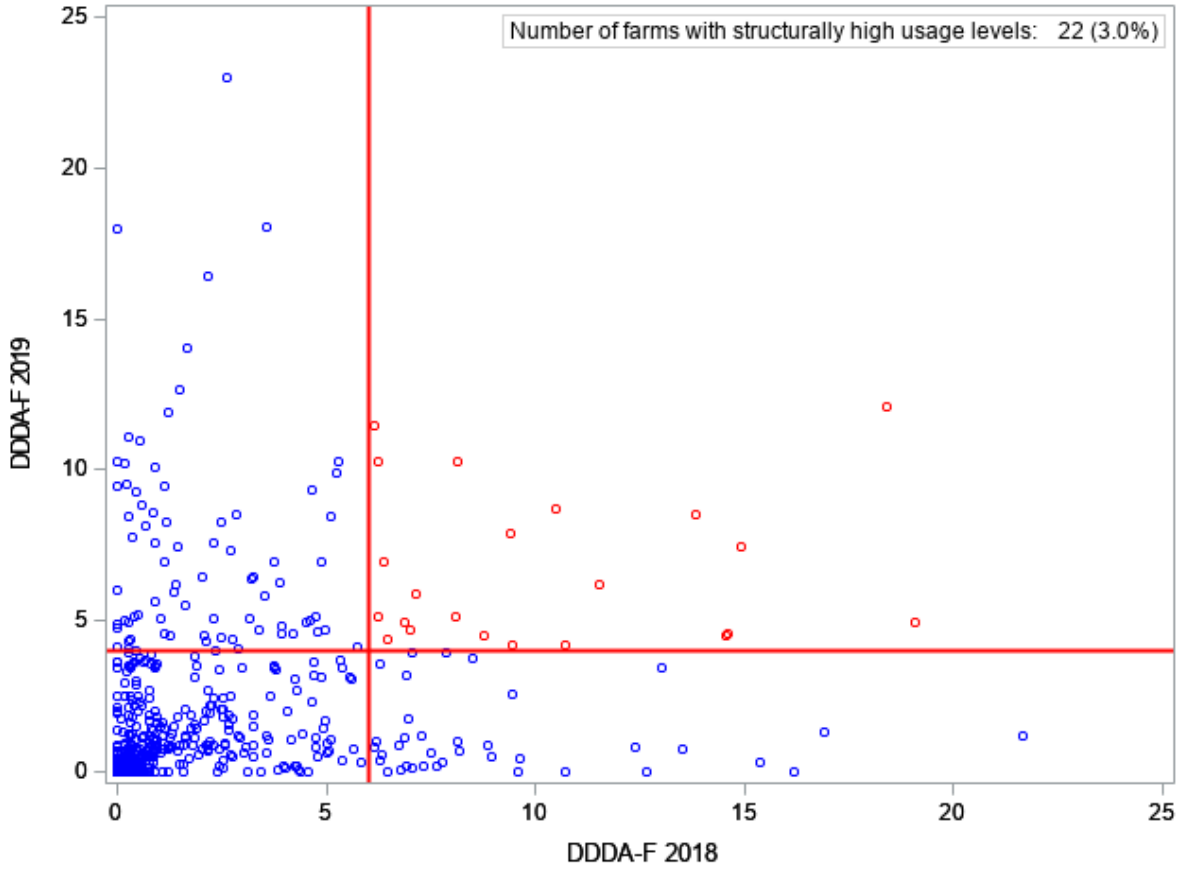


Table A42. Antibiotic use in $DDDA_F$ at rosé veal fattening farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	104	0.34	0.72	0.57
1st choice	Macrolides/lincosamides	Oral	592	0.00	0.00	0.39
1st choice	Macrolides/lincosamides	Parenteral	509	0.00	0.01	0.06
1st choice	Penicillins	Parenteral	271	0.07	0.21	0.17
1st choice	Tetracyclines	Oral	378	0.00	3.27	1.93
1st choice	Tetracyclines	Parenteral	634	0.00	0.00	0.02
1st choice	Trimethoprim/sulfonamides	Oral	542	0.00	0.10	0.46
1st choice	Trimethoprim/sulfonamides	Parenteral	548	0.00	0.00	0.02
2nd choice	Aminoglycosides	Oral	674	0.00	0.00	0.01
2nd choice	Aminoglycosides	Parenteral	679	0.00	0.00	0.01
2nd choice	Aminopenicillins	Intramammary	731	0.00	0.00	0.00
2nd choice	Aminopenicillins	Oral	691	0.00	0.00	0.04
2nd choice	Aminopenicillins	Parenteral	427	0.00	0.05	0.04
2nd choice	Quinolones	Oral	720	0.00	0.00	0.01
2nd choice	Fixed-dose combinations	Parenteral	701	0.00	0.00	0.00
2nd choice	Macrolides/lincosamides	Parenteral	424	0.00	0.17	0.13
3rd choice	Fluoroquinolones	Oral	731	0.00	0.00	0.00
3rd choice	Fluoroquinolones	Parenteral	722	0.00	0.00	0.00
3rd choice	Polymyxins	Oral	731	0.00	0.00	0.00
3rd choice	Polymyxins	Parenteral	723	0.00	0.00	0.00

2.4 Rosé veal combination farms

Number of rosé veal combination farms: 76
Number of rosé veal combination farms with $DDDA_F$=0: 4 (5.3%)
Number of rosé veal combination farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of rosé veal combination farms that used fluoroquinolones: 10 (13.2%)
Number of rosé veal combination farms that used polymyxins: 1 (1.3%)

Table A43. Antibiotic use in $DDDA_F$ at rosé veal combination farms from 2011 to 2019*

Year	N	Mean	Median	P75	P90
2011	313	34.6	17.3	29.7	45.7
2012	365	21.5	13.2	23.7	37.4
2013	276	11.7	10.1	16.2	23.8
2014	215	13.0	12.0	17.1	21.9
2015	238	11.8	11.2	16.2	21.4
2016	229	11.1	11.3	16.6	20.6
2017	212	12.8	12.6	17.3	22.6
2018	186	14.8	14.1	18.1	21.9
2019	76	16.4	14.4	22.1	30.5

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A30. 2012, 2018 and 2019 $DDDA_F$ distributions for rosé veal combination farms

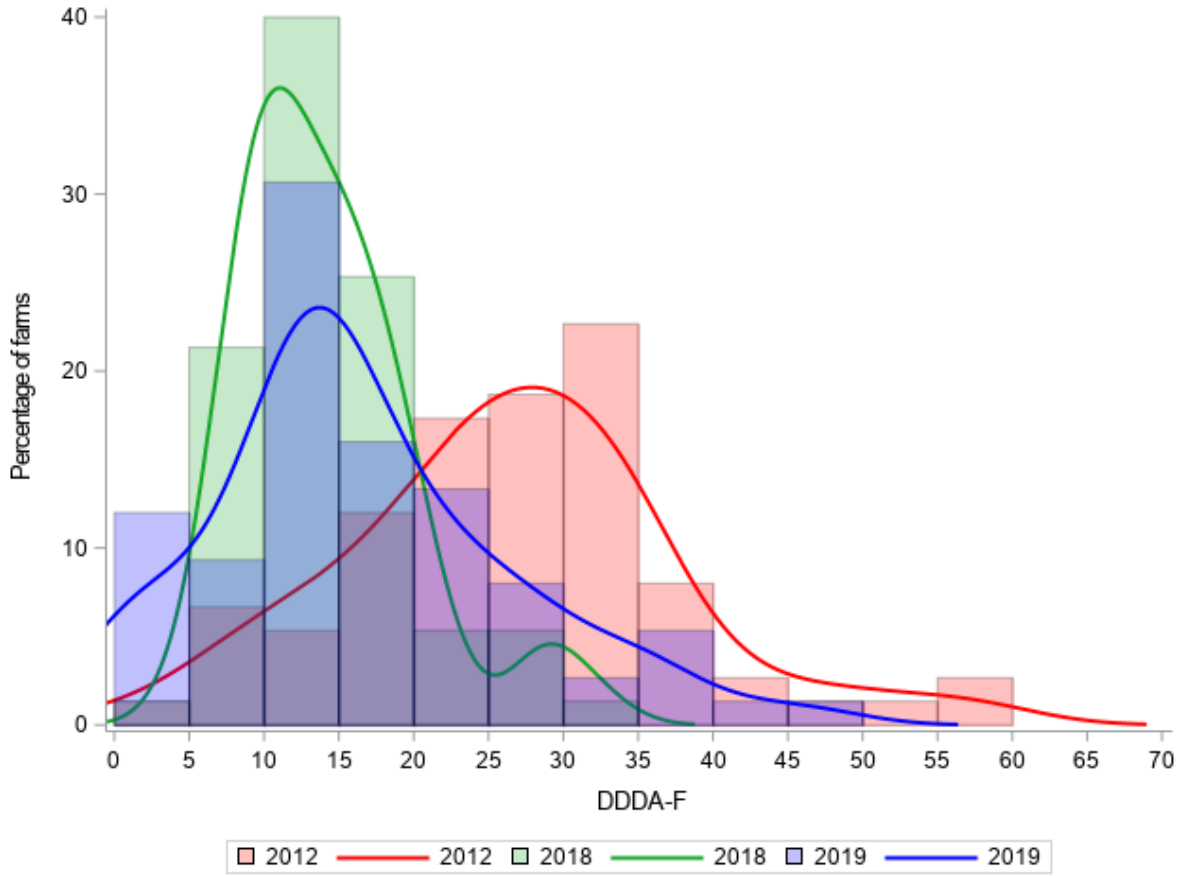


Figure A31. Scatter plot of 2018 and 2019 $DDDA_F$ values for rosé veal combination farms. The red solid lines represent the action thresholds defined by the SDa. The number of farms with structurally high usage levels (farms whose usage levels exceeded the action threshold in both years) is listed in the upper-left corner of the scatter plot

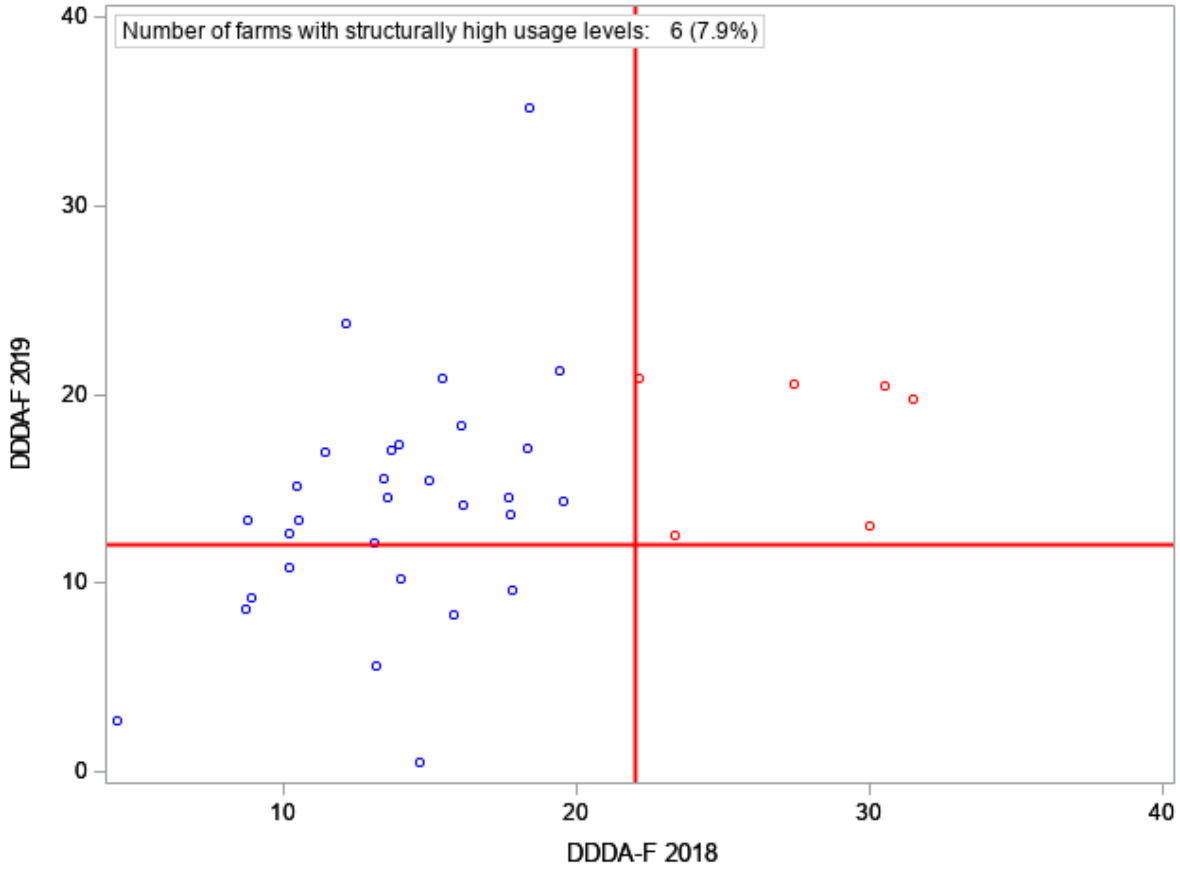


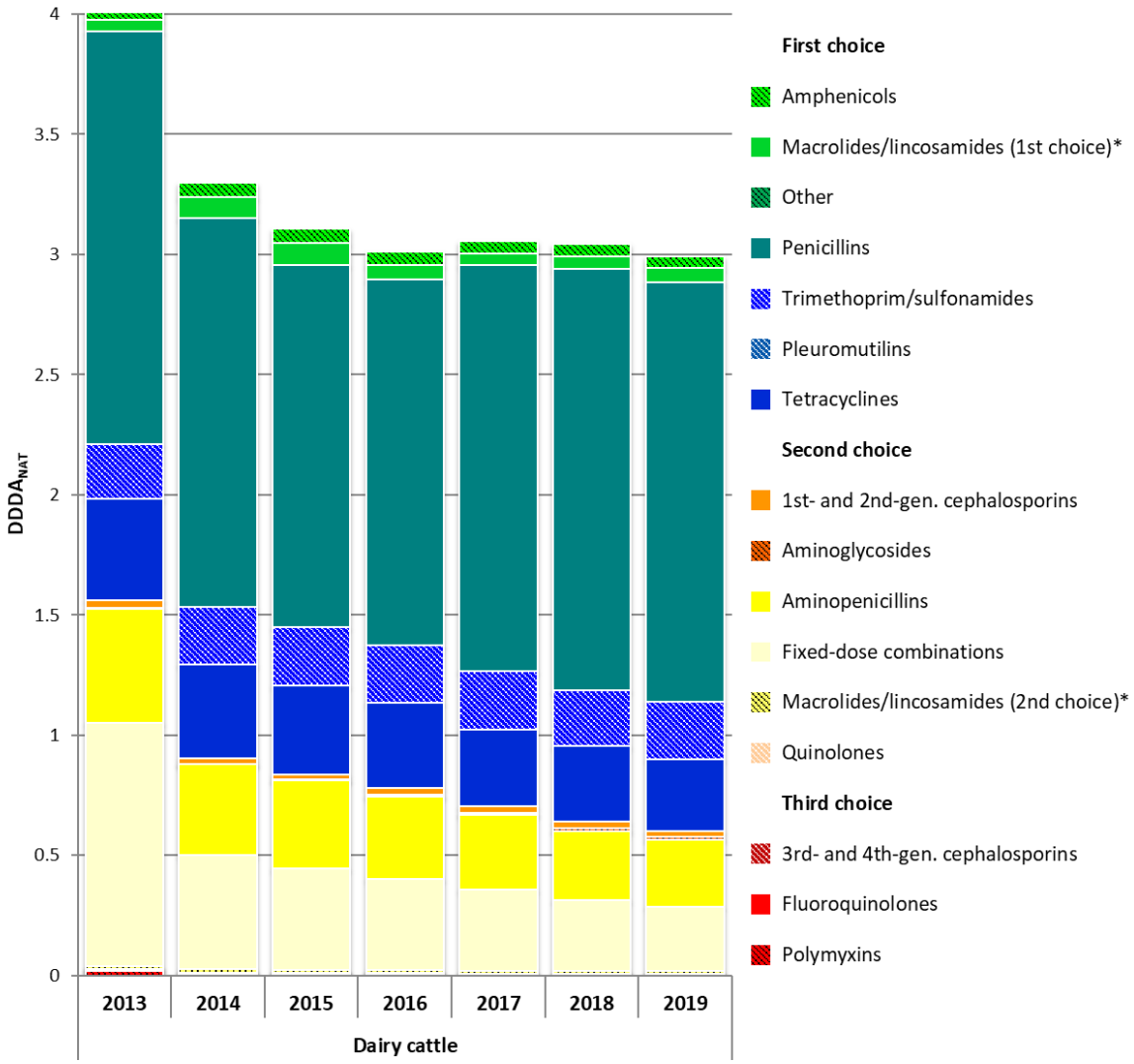
Table A44. Antibiotic use in $DDDA_F$ at rosé veal combination farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	4	1.09	2.11	1.57
1st choice	Macrolides/lincosamides	Oral	16	2.72	3.98	2.78
1st choice	Macrolides/lincosamides	Parenteral	27	0.03	0.07	0.14
1st choice	Penicillins	Parenteral	10	0.21	0.42	0.30
1st choice	Tetracyclines	Oral	8	7.58	11.16	8.51
1st choice	Tetracyclines	Parenteral	64	0.00	0.00	0.01
1st choice	Trimethoprim/sulfonamides	Oral	36	0.26	1.32	1.09
1st choice	Trimethoprim/sulfonamides	Parenteral	26	0.02	0.06	0.04
2nd choice	Aminoglycosides	Oral	41	0.00	0.04	0.11
2nd choice	Aminoglycosides	Parenteral	48	0.00	0.03	0.11
2nd choice	Aminopenicillins	Oral	34	0.12	1.12	0.95
2nd choice	Aminopenicillins	Parenteral	17	0.07	0.15	0.11
2nd choice	Quinolones	Oral	62	0.00	0.00	0.27
2nd choice	Fixed-dose combinations	Parenteral	72	0.00	0.00	0.00
2nd choice	Macrolides/lincosamides	Parenteral	25	0.19	0.41	0.35
3rd choice	Fluoroquinolones	Oral	75	0.00	0.00	0.00
3rd choice	Fluoroquinolones	Parenteral	67	0.00	0.00	0.01
3rd choice	Polymyxins	Parenteral	75	0.00	0.00	0.00

Dairy cattle farming sector

1. Antibiotic use in $DDDA_{NAT}$

Figure A32. $DDDA_{NAT}$ trends in the dairy cattle farming sector over the 2013-2019 period, by pharmacotherapeutic group



* In the poultry farming sector, all macrolides/lincosamides (with the exception of lincomycin and spiramycin) are categorized as second-choice antibiotics. In other livestock sectors, only long-acting macrolides are categorized as second-choice antibiotics.

2. Antibiotic use in $DDDA_F$

Number of dairy cattle farms: 15,871
Number of dairy cattle farms with $DDDA_F$=0: 300 (1.9%)
Number of dairy cattle farms that used third- and fourth-generation cephalosporins: 142 (0.9%)
Number of dairy cattle farms that used fluoroquinolones: 899 (5.7%)
Number of dairy cattle farms that used polymyxins: 301 (1.9%)

Table A45. Antibiotic use at dairy cattle farms, presented as overall antibiotic use from 2012 to 2019 (A), use of dry cow (intramammary) antibiotics (B), use of mastitis injectors (C), and use of oral antibiotics in calves (D)

A **Overall antibiotic use, in $DDDA_F$***

Year	N	Mean	Median	P75	P90
2012	18,053	2.9	2.7	3.8	4.9
2013	18,005	2.8	2.8	3.7	4.7
2014	17,747	2.3	2.2	3.0	3.9
2015	17,737	2.2	2.1	2.9	3.7
2016	17,529	2.1	2.1	2.9	3.7
2017	17,121	2.1	2.1	2.9	3.8
2018	16,499	2.1	2.1	2.9	3.8
2019	15,871	2.2	2.1	3.0	3.9

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

B **Use of dry cow (intramammary) antibiotics, in $DDDA_F$ (animals >2 years of age)**

N	Mean	Median	P75	3.5
15,871	1.1	1.0	1.7	2.4

C **Use of mastitis injectors, in $DDDA_F$ (animals >2 years of age)**

N	Mean	Median	P75	P90
15,871	0.7	0.5	0.9	1.5

D **Use of oral antibiotics in calves, in $DDDA_F$ (animals <56 days of age)**

N	Mean	Median	P75	P90
15,871	2.0	0.0	0.0	4.4

Figure A33. 2012, 2018 and 2019 $DDDA_F$ distributions for dairy cattle farms

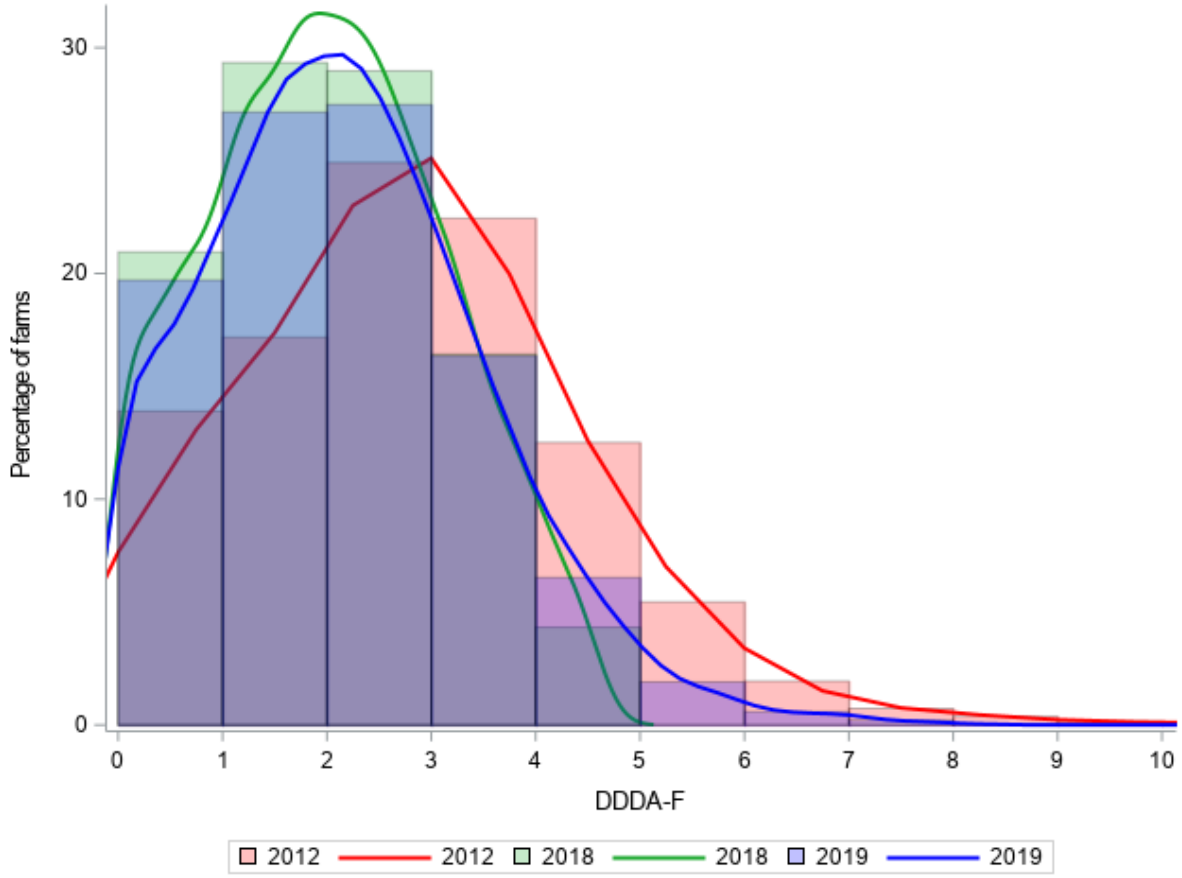


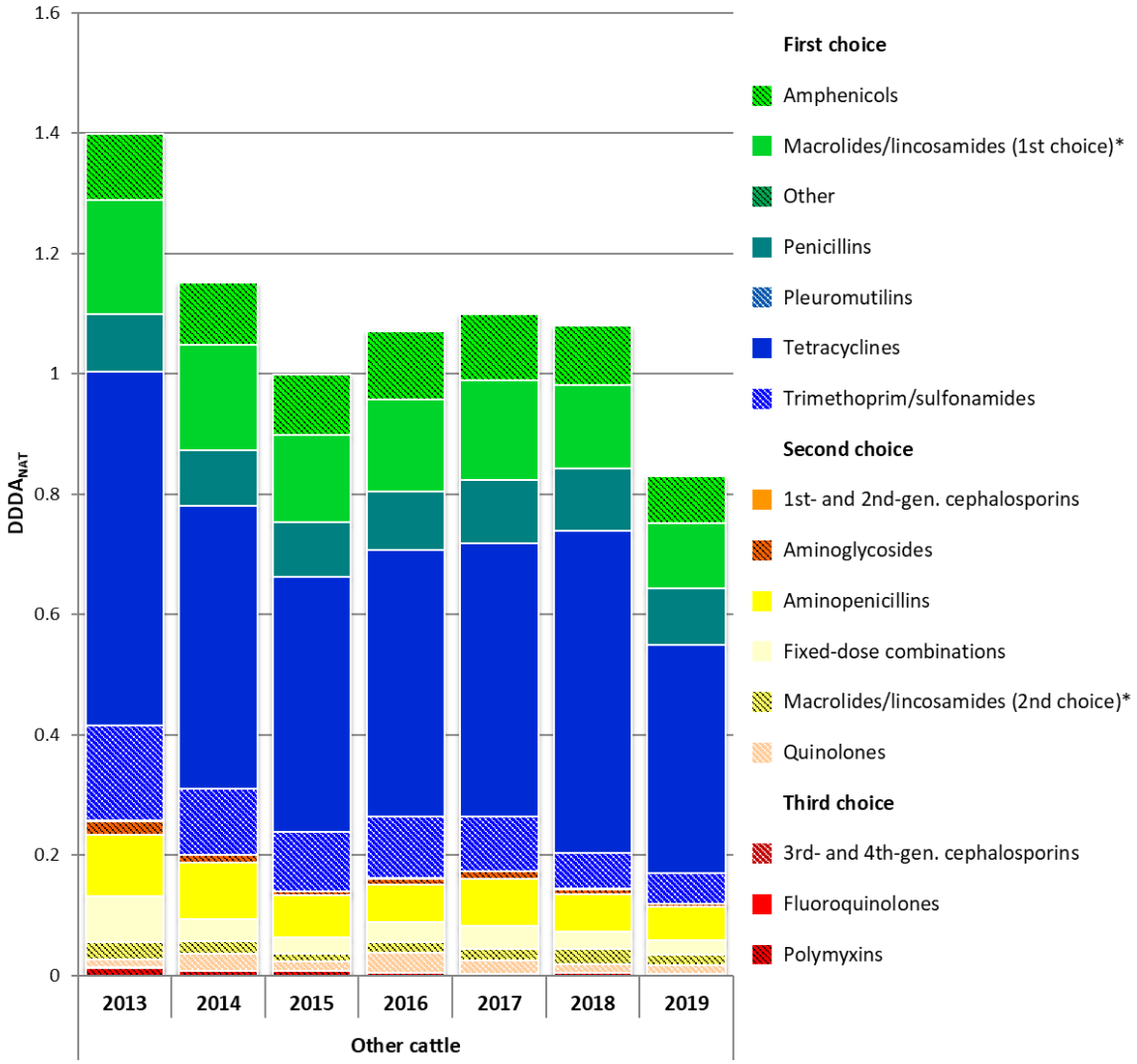
Table A46. Antibiotic use in $DDDA_F$ at dairy cattle farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	9,088	0.00	0.04	0.03
1st choice	Macrolides/lincosamides	Intramammary	15,865	0.00	0.00	0.00
1st choice	Macrolides/lincosamides	Oral	15,863	0.00	0.00	0.00
1st choice	Macrolides/lincosamides	Parenteral	11,663	0.00	0.00	0.04
1st choice	Penicillins	Intramammary for dry cow therapy	3,389	0.83	1.40	0.89
1st choice	Penicillins	Intramammary	9,770	0.00	0.26	0.20
1st choice	Penicillins	Parenteral	3,403	0.11	0.29	0.21
1st choice	Tetracyclines	Intrauterine	8,122	0.00	0.08	0.05
1st choice	Tetracyclines	Oral	15,561	0.00	0.00	0.00
1st choice	Tetracyclines	Parenteral	3,412	0.10	0.22	0.16
1st choice	Trimethoprim/sulfonamides	Oral	14,742	0.00	0.00	0.00
1st choice	Trimethoprim/sulfonamides	Parenteral	2,966	0.11	0.24	0.17
2nd choice	Aminoglycosides	Oral	14,179	0.00	0.00	0.00
2nd choice	Aminoglycosides	Parenteral	15,470	0.00	0.00	0.00
2nd choice	Aminopenicillins	Intramammary for dry cow therapy	15,870	0.00	0.00	0.00
2nd choice	Aminopenicillins	Intramammary	5,881	0.09	0.26	0.18
2nd choice	Aminopenicillins	Oral	15,870	0.00	0.00	0.00
2nd choice	Aminopenicillins	Parenteral	8,134	0.00	0.06	0.05
2nd choice	1st- and 2nd-gen. cephalosporins	Intramammary	15,119	0.00	0.00	0.01
2nd choice	1st- and 2nd-gen. cephalosporins	Intrauterine	12,152	0.00	0.00	0.01
2nd choice	Quinolones	Oral	15,865	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Intramammary for dry cow therapy	15,463	0.00	0.00	0.01
2nd choice	Fixed-dose combinations	Intramammary	8,625	0.00	0.20	0.15
2nd choice	Fixed-dose combinations	Oral	15,870	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Parenteral	12,380	0.00	0.00	0.02
2nd choice	Macrolides/lincosamides	Parenteral	14,154	0.00	0.00	0.01
3rd choice	3rd- and 4th-gen. cephalosporins	Intramammary	15,737	0.00	0.00	0.00
3rd choice	3rd- and 4th-gen. cephalosporins	Parenteral	15,854	0.00	0.00	0.00
3rd choice	Fluoroquinolones	Parenteral	14,972	0.00	0.00	0.00
3rd choice	Polymyxins	Oral	15,822	0.00	0.00	0.00
3rd choice	Polymyxins	Parenteral	15,619	0.00	0.00	0.00

Non-dairy cattle farming sector

1. Antibiotic use in $DDDA_{NAT}$

Figure A34. $DDDA_{NAT}$ trends in the non-dairy cattle farming sector over the 2013-2019 period, by pharmacotherapeutic group



* In the poultry farming sector, all macrolides/lincosamides (with the exception of lincomycin and spiramycin) are categorized as second-choice antibiotics. In other livestock sectors, only long-acting macrolides are categorized as second-choice antibiotics.

2. Antibiotic use in $DDDA_F$

2.1 Suckler cow farms

Number of suckler cow farms: 8,263
Number of suckler cow farms with $DDDA_F$=0: 4,128 (50.0%)
Number of suckler cow farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of suckler cow farms that used fluoroquinolones: 88 (1.1%)
Number of suckler cow farms that used polymyxins: 46 (0.6%)

Table A47. Antibiotic use in $DDDA_F$ at suckler cow farms from 2012 to 2019*

Year	N	Mean	Median	P75	P90
2012	11,927	0.9	0.0	0.6	2.0
2013	9,857	0.7	0.1	0.8	2.2
2014	9,588	0.7	0.1	0.7	2.0
2015	9,305	0.6	0.1	0.7	2.0
2016	9,067	0.6	0.1	0.7	1.9
2017	9,351	0.5	0.0	0.6	1.7
2018	8,932	0.6	0.0	0.6	1.8
2019	8,263	0.6	0.0	0.6	1.9

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A35. 2012, 2018 and 2019 $DDDA_F$ distributions for suckler cow farms (no probability density functions can be shown due to too little variation)

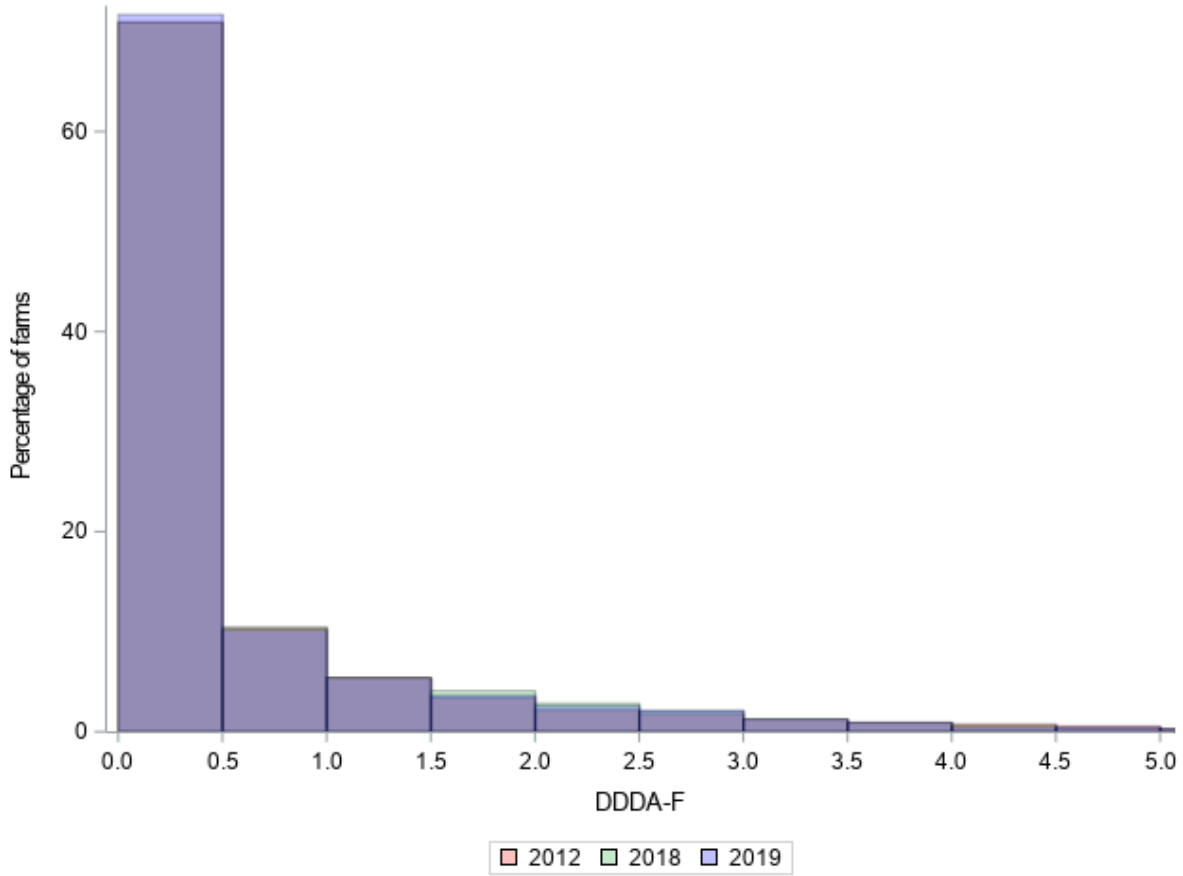


Table A48. Antibiotic use in $DDDA_F$ at suckler cow farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	7,028	0.00	0.00	0.04
1st choice	Macrolides/lincosamides	Oral	8,259	0.00	0.00	0.00
1st choice	Macrolides/lincosamides	Parenteral	7,941	0.00	0.00	0.01
1st choice	Penicillins	Intramammary for dry cow therapy	8,000	0.00	0.00	0.04
1st choice	Penicillins	Intramammary	8,179	0.00	0.00	0.01
1st choice	Penicillins	Parenteral	6,021	0.00	0.06	0.20
1st choice	Tetracyclines	Intrauterine	7,068	0.00	0.00	0.03
1st choice	Tetracyclines	Oral	8,216	0.00	0.00	0.01
1st choice	Tetracyclines	Parenteral	6,913	0.00	0.00	0.06
1st choice	Trimethoprim/sulfonamides	Oral	8,154	0.00	0.00	0.00
1st choice	Trimethoprim/sulfonamides	Parenteral	7,300	0.00	0.00	0.02
2nd choice	Aminoglycosides	Oral	8,190	0.00	0.00	0.00
2nd choice	Aminoglycosides	Parenteral	8,194	0.00	0.00	0.00
2nd choice	Aminopenicillins	Intramammary	7,997	0.00	0.00	0.01
2nd choice	Aminopenicillins	Oral	8,262	0.00	0.00	0.00
2nd choice	Aminopenicillins	Parenteral	7,071	0.00	0.00	0.05
2nd choice	1st- and 2nd-gen. cephalosporins	Intramammary	8,236	0.00	0.00	0.00
2nd choice	1st- and 2nd-gen. cephalosporins	Intrauterine	8,172	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Intramammary for dry cow therapy	8,253	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Intramammary	8,106	0.00	0.00	0.01
2nd choice	Fixed-dose combinations	Parenteral	7,472	0.00	0.00	0.07
2nd choice	Macrolides/lincosamides	Parenteral	7,804	0.00	0.00	0.02
3rd choice	Fluoroquinolones	Parenteral	8,175	0.00	0.00	0.00
3rd choice	Polymyxins	Oral	8,260	0.00	0.00	0.00
3rd choice	Polymyxins	Parenteral	8,220	0.00	0.00	0.00

2.2 Rearing farms

Number of rearing farms: 573
Number of rearing farms with $DDDA_F$=0: 422 (73.6%)
Number of rearing farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of rearing farms that used fluoroquinolones: 0 (0.0%)
Number of rearing farms that used polymyxins: 2 (0.3%)

Table A49. Antibiotic use in $DDDA_F$ at rearing farms from 2012 to 2019*

Year	N	Mean	Median	P75	P90
2012**	-	-	-	-	-
2013	472	1.1	0.0	0.2	2.3
2014	474	1.4	0.0	0.2	1.8
2015	470	0.8	0.0	0.2	1.7
2016	435	0.8	0.0	0.1	1.3
2017	520	1.0	0.0	0.0	1.6
2018	544	1.0	0.0	0.0	1.4
2019	573	1.0	0.0	0.1	1.5

* Only years for which similar $DDDA_F$ calculation methods were used have been included.
** Rearing and beef farms were grouped together for 2012, as the available data did not allow for categorization based on sex.

Figure A36. 2013, 2018 and 2019 $DDDA_F$ distributions for rearing farms (no probability density functions can be shown due to too little variation)

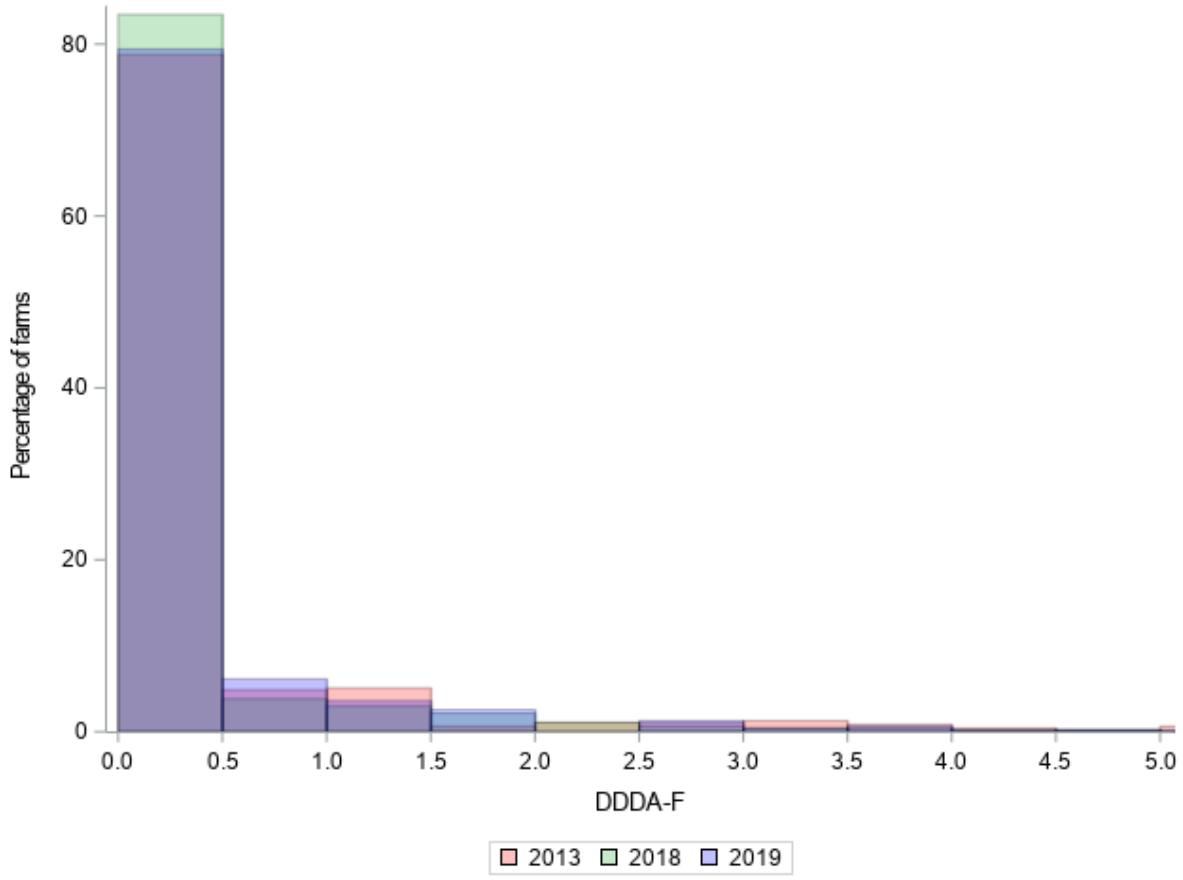


Table A50. Antibiotic use in $DDDA_F$ at rearing farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	472	0.00	0.00	0.17
1st choice	Macrolides/lincosamides	Oral	559	0.00	0.00	0.10
1st choice	Macrolides/lincosamides	Parenteral	552	0.00	0.00	0.01
1st choice	Penicillins	Intramammary for dry cow therapy	572	0.00	0.00	0.02
1st choice	Penicillins	Parenteral	504	0.00	0.00	0.08
1st choice	Tetracyclines	Intrauterine	572	0.00	0.00	0.00
1st choice	Tetracyclines	Oral	544	0.00	0.00	0.41
1st choice	Tetracyclines	Parenteral	532	0.00	0.00	0.04
1st choice	Trimethoprim/sulfonamides	Oral	560	0.00	0.00	0.06
1st choice	Trimethoprim/sulfonamides	Parenteral	531	0.00	0.00	0.04
2nd choice	Aminoglycosides	Oral	564	0.00	0.00	0.01
2nd choice	Aminoglycosides	Parenteral	571	0.00	0.00	0.00
2nd choice	Aminopenicillins	Oral	567	0.00	0.00	0.01
2nd choice	Aminopenicillins	Parenteral	556	0.00	0.00	0.01
2nd choice	1st- and 2nd-gen. cephalosporins	Intrauterine	572	0.00	0.00	0.00
2nd choice	Quinolones	Oral	571	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Intramammary	570	0.00	0.00	0.01
2nd choice	Fixed-dose combinations	Parenteral	566	0.00	0.00	0.01
2nd choice	Macrolides/lincosamides	Parenteral	537	0.00	0.00	0.05
3rd choice	Polymyxins	Parenteral	571	0.00	0.00	0.00

2.3 Beef farms

Number of beef farms: 2,778
Number of beef farms with $DDDA_F$=0: 1,900 (68.4%)
Number of beef farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of beef farms that used fluoroquinolones: 15 (0.5%)
Number of beef farms that used polymyxins: 15 (0.5%)

Table A51. Antibiotic use in $DDDA_F$ at beef farms from 2012 to 2019*

Year	N	Mean	Median	P75	P90
2012**	-	-	-	-	-
2013	3,316	1.8	0.0	0.6	4.2
2014	3,297	1.7	0.0	0.5	4.4
2015	3,196	1.5	0.0	0.4	2.9
2016	3,046	1.6	0.0	0.4	2.9
2017	2,919	1.3	0.0	0.3	2.3
2018	2,852	1.3	0.0	0.3	2.2
2019	2,778	1.0	0.0	0.2	1.5

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A37. 2013, 2018 and 2019 $DDDA_F$ distributions for beef farms (no probability density functions can be shown due to too little variation)

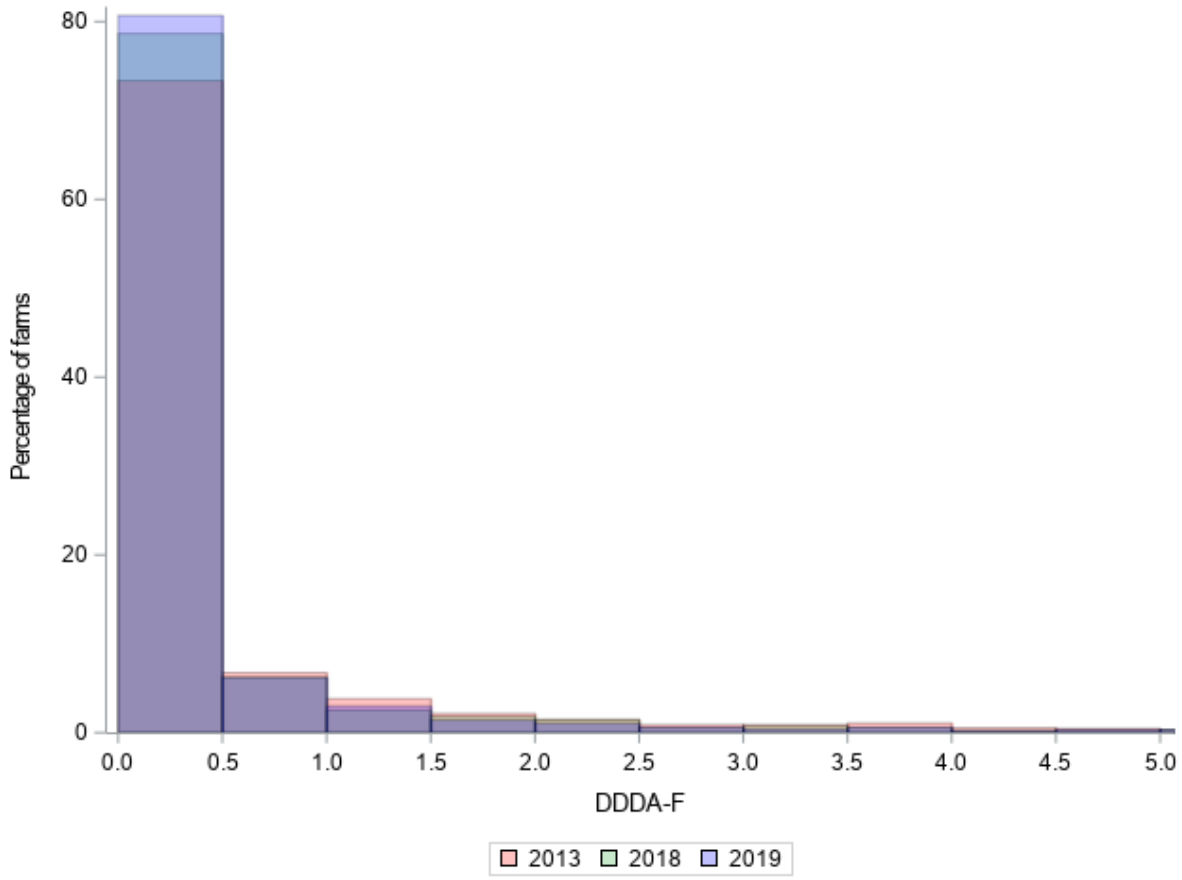


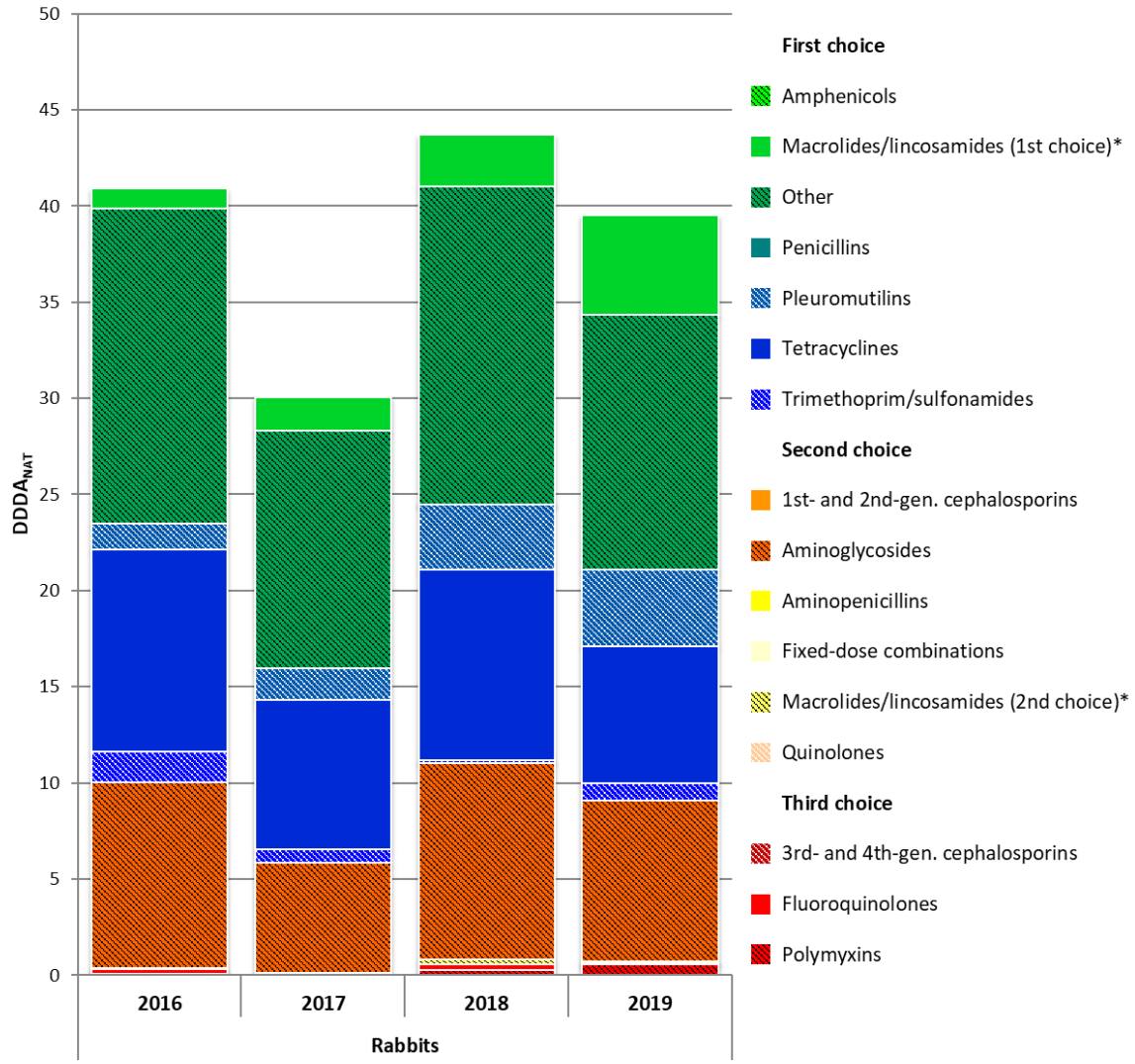
Table A52. Antibiotic use in $DDDA_F$ at beef farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Parenteral	2,232	0.00	0.00	0.12
1st choice	Macrolides/lincosamides	Oral	2,649	0.00	0.00	0.14
1st choice	Macrolides/lincosamides	Parenteral	2,586	0.00	0.00	0.01
1st choice	Penicillins	Intramammary for dry cow therapy	2,760	0.00	0.00	0.00
1st choice	Penicillins	Intramammary	2,776	0.00	0.00	0.00
1st choice	Penicillins	Parenteral	2,287	0.00	0.00	0.08
1st choice	Tetracyclines	Intrauterine	2,700	0.00	0.00	0.00
1st choice	Tetracyclines	Oral	2,571	0.00	0.00	0.41
1st choice	Tetracyclines	Parenteral	2,492	0.00	0.00	0.04
1st choice	Trimethoprim/sulfonamides	Oral	2,691	0.00	0.00	0.06
1st choice	Trimethoprim/sulfonamides	Parenteral	2,547	0.00	0.00	0.01
2nd choice	Aminoglycosides	Oral	2,712	0.00	0.00	0.00
2nd choice	Aminoglycosides	Parenteral	2,743	0.00	0.00	0.00
2nd choice	Aminopenicillins	Intramammary	2,766	0.00	0.00	0.00
2nd choice	Aminopenicillins	Oral	2,742	0.00	0.00	0.03
2nd choice	Aminopenicillins	Parenteral	2,491	0.00	0.00	0.02
2nd choice	1st- and 2nd-gen. cephalosporins	Intrauterine	2,776	0.00	0.00	0.00
2nd choice	Quinolones	Oral	2,759	0.00	0.00	0.01
2nd choice	Fixed-dose combinations	Intramammary for dry cow therapy	2,776	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Intramammary	2,767	0.00	0.00	0.00
2nd choice	Fixed-dose combinations	Parenteral	2,664	0.00	0.00	0.02
2nd choice	Macrolides/lincosamides	Parenteral	2,538	0.00	0.00	0.07
3rd choice	Fluoroquinolones	Parenteral	2,763	0.00	0.00	0.00
3rd choice	Polymyxins	Oral	2,776	0.00	0.00	0.00
3rd choice	Polymyxins	Parenteral	2,765	0.00	0.00	0.00

Rabbit farming sector

1. Antibiotic use in $DDDA_{NAT}$

Figure A38. $DDDA_{NAT}$ trends in the rabbit farming sector over the 2016-2019 period, by pharmacotherapeutic group



* In the poultry farming sector, all macrolides/lincosamides (with the exception of lincomycin and spiramycin) are categorized as second-choice antibiotics. In other livestock sectors, only long-acting macrolides are categorized as second-choice antibiotics.

2. Antibiotic use in $DDDA_F$

Number of rabbit farms: 36
Number of rabbit farms with $DDDA_F$=0: 2 (5.6%)
Number of rabbit farms that used third- and fourth-generation cephalosporins: 0 (0.0%)
Number of rabbit farms that used fluoroquinolones: 1 (2.8%)
Number of rabbit farms that used polymyxins: 3 (8.3%)

Table A53. Antibiotic use in $DDDA_F$ at rabbit farms from 2016 to 2019*

Year	N	Mean	Median	P75	P90
2016	41	40.9	31.8	60.3	84.4
2017	49	25.4	21.7	37.9	49.4
2018	40	47.9	44.2	61.1	96.3
2019	36	42.5	40.4	60.8	75.9

* Only years for which similar $DDDA_F$ calculation methods were used have been included.

Figure A39. 2016, 2018 and 2019 $DDDA_F$ distributions for rabbit farms

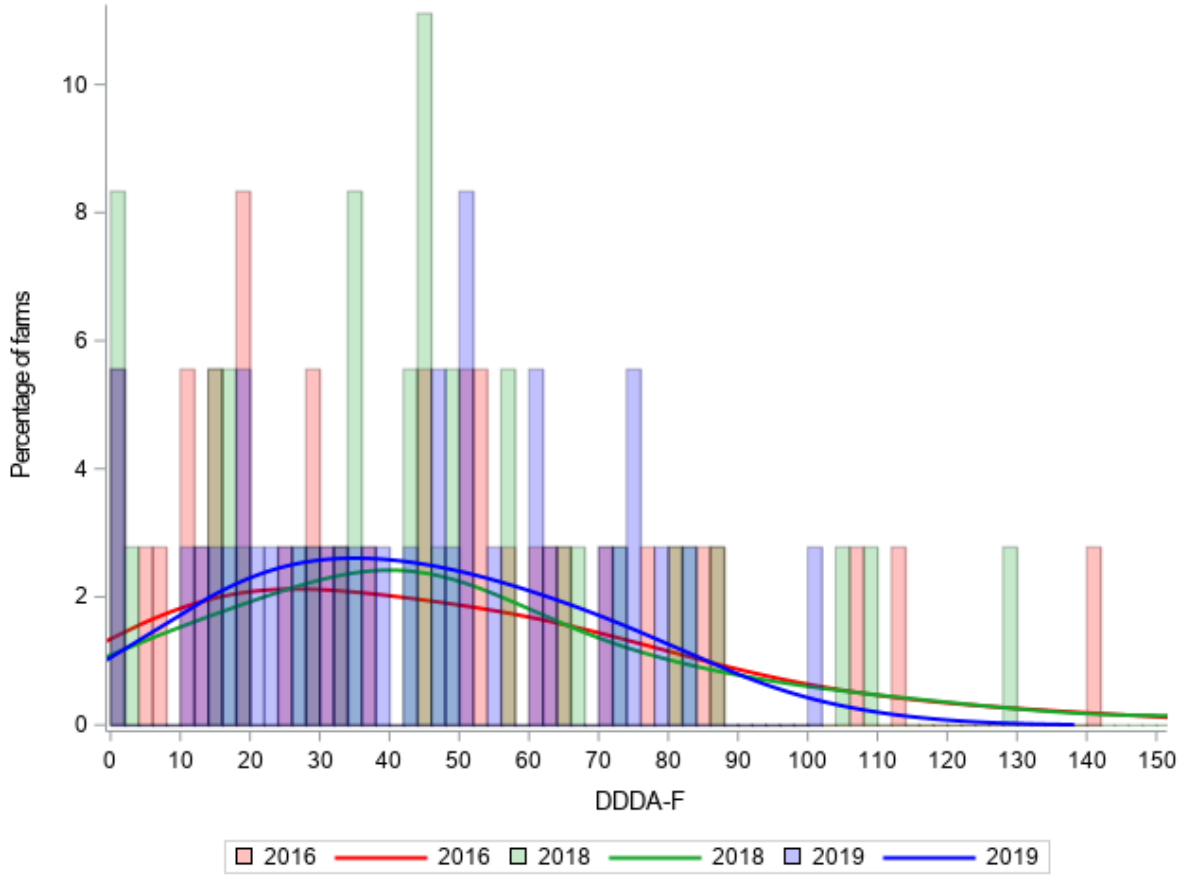


Table A54. Antibiotic use in $DDDA_F$ at rabbit farms in 2019, by pharmacotherapeutic group and route of administration

Category of antibiotics	Pharmacotherapeutic group	Route of administration	# of farms with $DDDA_F$=0	$DDDA_F$		
				Median	P75	Mean
1st choice	Amphenicols	Oral	35	0.00	0.00	0.00
1st choice	Macrolides/lincosamides	Oral	21	0.00	5.83	4.63
1st choice	Other	Oral	7	12.78	19.67	14.70
1st choice	Pleuromutilins	Oral	18	0.30	8.90	4.17
1st choice	Tetracyclines	Oral	12	5.06	9.54	7.39
1st choice	Tetracyclines	Parenteral	19	0.00	1.09	0.66
1st choice	Trimethoprim/sulfonamides	Oral	32	0.00	0.00	1.30
2nd choice	Aminoglycosides	Oral	15	2.86	15.13	8.93
2nd choice	Macrolides/lincosamides	Parenteral	35	0.00	0.00	0.05
3rd choice	Fluoroquinolones	Oral	35	0.00	0.00	0.12
3rd choice	Polymyxins	Oral	33	0.00	0.00	0.55

Numbers of animals in the Dutch livestock sector

Table A55. Numbers of agricultural livestock (x1,000) in the Netherlands from 2009 to 2019, according to data provided by CBS (for poultry, veal calves, meat rabbits and goats) and EUROSTAT (for the other types of livestock)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Piglets (<20 kg)	4,809	4,649	4,797	4,993	4,920	5,116	5,408	4,986	5,522	5,287	5,002
Sows	1,100	1,098	1,106	1,081	1,095	1,106	1,053	1,022	1,066	967	1,047
Fattening pigs	4,099	4,419	4,179	4,189	4,209	4,087	4,223	4,140	3,967	4,032	4,163
Other pigs	2,100	2,040	2,021	1,841	1,789	1,765	1,769	1,733	1,741	1,623	1,709
Turkeys	1,060	1,036	990	827	841	794	863	762	671	556	532
All poultry combined	98,706	102,585	98,253	96,268	98,587	103,944	107,743	105,550	105,184	105,104	101,741
With broilers accounting for	41,914	43,352	44,358	43,285	44,748	47,020	49,107	48,378	48,237	48,971	48,684
Veal calves	894	928	906	908	925	921	909	956	953	1,017	1,066
All cattle combined	3,112	3,039	2,993	3,045	3,064	3,230	3,360	3,353	3,082	2,634	2,679
With dairy cattle accounting for	1,562	1,518	1,504	1,541	1,597	1,610	1,717	1,794	1,665	1,552	1,590
Goats	374	353	380	397	413	431	470	500	533	588	615
Sheep	1,091	1,211	1,113	1,093	1,074	1,070	1,032	1,040	1,015	743	758
Weaned meat rabbits	271	260	262	284	270	278	333	318	300	291	289
Breeding does	41	39	39	43	41	43	48	45	43	41	48

Antibiotic use in terms of DDD_{VET}/animal-year

Table A56. Antibiotic use in terms of DDD_{VET}/animal-year from 2016 to 2019, by livestock sector

Pharmacotherapeutic group	Broiler farming sector				Turkey farming sector				Pig farming sector			
	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
1st-choice antibiotics	**4.02**	**3.79**	**3.73**	**3.86**	**16.12**	**11.37**	**15.15**	**15.43**	**6.91**	**6.62**	**6.64**	**6.30**
As a proportion of overall AB use	**34.8%**	**35.2%**	**32.8%**	**34.6%**	**57.7%**	**49.5%**	**60.8%**	**61.8%**	**79.1%**	**77.7%**	**77.7%**	**78.9%**
Amphenicols	0.00	*	*	*	0.00	*	*	*	0.18	0.19	0.19	0.19
Macrolides/lincosamides	0.24	0.09	0.07	0.05	1.28	*	*	*	0.81	0.85	0.85	0.95
Penicillins	0.68	0.58	0.43	0.86	3.64	1.61	2.58	1.58	0.57	0.54	0.56	0.49
Pleuromutilins	*	*	*	*	*	0.14	0.17	0.00	0.07	0.10	0.13	0.10
Tetracyclines	1.32	1.27	1.42	1.17	10.71	9.20	11.98	13.42	3.46	3.42	3.25	2.96
Trimethoprim/sulfonamides	1.78	1.86	1.81	1.78	0.49	0.42	0.43	0.43	1.81	1.51	1.65	1.60
2nd-choice antibiotics	**7.44**	**6.92**	**7.57**	**7.24**	**9.77**	**10.54**	**9.04**	**8.92**	**1.48**	**1.59**	**1.53**	**1.30**
As a proportion of overall AB use	**64.4%**	**64.2%**	**66.4%**	**64.8%**	**35.0%**	**45.9%**	**36.2%**	**35.8%**	**17.0%**	**18.6%**	**17.9%**	**16.3%**
Aminoglycosides	0.00	0.03	0.01	0.01	0.20	0.01	0.01	0.00	0.00	0.00	0.01	0.01
Aminopenicillins	6.28	5.53	5.74	5.91	9.56	8.95	7.44	8.81	0.97	1.01	0.94	0.78
1st- and 2nd-gen. cephalosporins	0.00	*	*	*	0.00	*	*	*	0.00	*	*	*
Quinolones	1.08	1.23	1.64	1.16	0.01	0.19	0.13	0.11	0.02	0.02	0.02	0.03
Fixed-dose combinations	0.09	0.02	0.03	0.01	0.00	*	*	*	0.08	0.03	0.02	0.02
Macrolides/lincosamides	0.00	0.11	0.15	0.16	0.00	1.40	1.46	0.00	0.41	0.53	0.55	0.45
3rd-choice antibiotics	**0.10**	**0.07**	**0.09**	**0.07**	**2.04**	**1.06**	**0.75**	**0.60**	**0.34**	**0.31**	**0.37**	**0.39**
As a proportion of overall AB use	**0.9%**	**0.7%**	**0.8%**	**0.7%**	**7.3%**	**4.6%**	**3.0%**	**2.4%**	**3.9%**	**3.6%**	**4.3%**	**4.9%**
3rd- and 4th-gen. cephalosporins	0.00	*	*	*	0.00	*	*	*	0.00	*	*	*
Fluoroquinolones	0.07	0.05	0.06	0.04	1.60	1.06	0.75	0.59	0.00	0.00	0.00	0.00
Polymyxins	0.03	0.02	0.03	0.03	0.44	0.00	0.00	0.01	0.34	0.31	0.37	0.39
Overall antibiotic use	**11.56**	**10.78**	**11.39**	**11.17**	**27.93**	**22.98**	**24.94**	**24.95**	**8.73**	**8.52**	**8.54**	**7.99**

Table A56. (continued)

Pharmacotherapeutic group	Dairy cattle farming sector				Veal farming sector				Non-dairy cattle farming sector			
	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
1st-choice antibiotics	**0.95**	**0.92**	**0.93**	**0.86**	**19.51**	**18.52**	**16.82**	**14.43**	**0.95**	**0.95**	**0.92**	**1.30**
As a proportion of overall AB use	**90.33%**	**89.76%**	**88.69%**	**87.11%**	**78.93%**	**87.61%**	**88.07%**	**86.93%**	**81.28%**	**86.12%**	**88.58%**	**92.63%**
Amphenicols	0.04	0.04	0.04	0.04	1.22	1.11	1.03	0.98	0.09	0.08	0.08	0.06
Macrolides/lincosamides	0.03	0.03	0.03	0.03	3.81	3.94	3.68	3.50	0.17	0.19	0.16	0.13
Penicillins	0.15	0.15	0.17	0.17	0.26	0.26	0.24	0.21	0.05	0.05	0.04	0.04
Pleuromutilins	*	*	*	*	*	*	*	*	*	*	*	*
Tetracyclines	0.24	0.22	0.22	0.21	10.88	10.61	9.84	7.79	0.47	0.48	0.54	0.37
Trimethoprim/sulfonamides	0.47	0.48	0.48	0.41	3.34	2.61	2.03	1.94	0.17	0.15	0.10	0.71
2nd-choice antibiotics	**0.09**	**0.10**	**0.11**	**0.12**	**5.11**	**2.57**	**2.24**	**2.15**	**0.21**	**0.15**	**0.11**	**0.10**
As a proportion of overall AB use	**8.64%**	**9.53%**	**10.59%**	**12.18%**	**20.68%**	**12.13%**	**11.71%**	**12.95%**	**18.25%**	**13.65%**	**10.94%**	**7.14%**
Aminoglycosides	0.01	0.01	0.01	0.01	0.09	0.09	0.08	0.07	0.01	0.01	0.00	0.00
Aminopenicillins	0.04	0.05	0.07	0.09	4.05	1.59	1.50	1.39	0.13	0.07	0.06	0.05
1st- and 2nd-gen. cephalosporins	0.00	*	0.00	*	0.00	*	*	*	0.00	*	0.00	*
Quinolones	0.00	0.00	0.00	0.00	0.85	0.74	0.47	0.52	0.04	0.03	0.02	0.02
Fixed-dose combinations	0.04	0.04	0.02	0.02	0.00	0.01	0.00	0.00	0.03	0.03	0.02	0.01
Macrolides/lincosamides	0.01	0.01	0.01	0.01	0.12	0.14	0.18	0.16	0.01	0.01	0.02	0.01
3rd-choice antibiotics	**0.01**	**0.01**	**0.01**	**0.01**	**0.10**	**0.06**	**0.04**	**0.02**	**0.01**	**0.00**	**0.00**	**0.00**
As a proportion of overall AB use	**1.03%**	**0.70%**	**0.72%**	**0.71%**	**0.39%**	**0.26%**	**0.22%**	**0.12%**	**0.47%**	**0.23%**	**0.47%**	**0.23%**
3rd- and 4th-gen. cephalosporins	0.00	0.00	0.00	0.00	0.00	*	*	*	0.00	*	*	*
Fluoroquinolones	0.00	0.00	0.00	0.00	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.00
Polymyxins	0.01	0.00	0.00	0.00	0.07	0.02	0.02	0.01	0.01	0.00	0.00	0.00
Overall antibiotic use	**1.05**	**1.03**	**1.05**	**0.99**	**24.72**	**21.15**	**19.10**	**16.60**	**1.17**	**1.10**	**1.04**	**1.41**

Phased implementation of the new benchmark thresholds

Table A57. Transitional benchmark thresholds for farms with sows and piglets

Year	Signaling threshold	Action threshold
2018	10	20
2019	7	10
2020	7	10
2021	-	7
2022	-	5

Table A58. Transitional benchmark thresholds for farms with fattening pigs

Year	Signaling threshold	Action threshold
2018	10	12
2019	7	10
2020	7	10
2021	-	7
2022	-	5

Table A59. Transitional benchmark thresholds for broiler farms with conventional breeds*

Phase	Years	Signaling threshold	Action threshold
1	2019-2021	14	26
2	2022-2023	12	24
3	2024-2025	10	20

Table A60. Transitional benchmark thresholds for broiler farms with alternative breeds*

Phase	Years	Signaling threshold	Action threshold
1	2019-2021	8	15
2 and 3	2022-2025	8	12

* The proposed phases for the transitional period are as follows: Phase 1: second half of 2019 + 2020 + 2021; Phase 2: 2022 + 2023; Phase 3: 2024 + 2025. The specified periods are not set in stone. At the end of each phase, evaluation will take place in order to determine whether it is feasible for the broiler farms concerned to enter the next phase.

Standardized body weights

Table A61. Standardized average body weights used for determining the $DDDA_{NAT}$ values, by livestock sector and production category

Livestock sector	Production category	Standardized body weight in kg[1]
Veal farming sector	Veal calves	172
Pig farming sector	Piglets (<20 kg)	10
	Sows	220
	Fattening pigs	70.2
	Other pigs	70
Broiler farming sector	Broilers	1
Turkey farming sector	Turkeys	6
Cattle farming sector	Dairy cattle	600
	Non-dairy cattle	500
Rabbit farming sector	Weaned meat rabbits	1.8
	Breeding does with kits	8.4

[1] Body weights as defined by LEI Wageningen UR, determined at the start of the agricultural census in the Netherlands. The standardized body weights are to be multiplied by the numbers of animals reported by CBS/EUROSTAT.

Table A62. Standardized average body weights used by the SDa for determining the $DDDA_F$ values, by livestock sector and production category

Livestock sector	Production category	Age group	Standardized body weight in kg[1]
Veal farming sector	Calves at white veal farms	0 - 222 days	160
	Calves at rosé veal starter farms	0 - 98 days	77.5
	Calves at rosé veal fattening farms	98 - 256 days	232.5
	Calves at rosé veal combination farms	0 - 256 days	205
Pig farming sector	Sows (all females that have been inseminated), breeding boars and heat-check boars		220
	Suckling piglets	0 - 25 days	4.5
	Replacement gilts	7 months - 1st insemination	135
	Weaned piglets	25 - 74 days	17.5
	Fattening pigs	Until ready for slaughter	70
	Gilts	74 days - 7 months	70
Broiler farming sector[2]	Conventional broilers	0 - 45 days	n/a
	Alternative broilers	0 - 70 days	n/a
	Parent stock at rearing farms	0 - 20 weeks	n/a
	Grandparent stock at rearing farms	0 - 20 weeks	n/a
	Parent stock at production farms	>20 weeks	3
	Grandparent stock at production farms	>20 weeks	3
Layer farming sector[2]	Layers	>18 weeks	1.6
	Layer pullets at rearing farms	0 - 18 weeks	n/a
	Parent stock at rearing farms	0 - 18 weeks	n/a
	Grandparent stock at rearing farms	0 - 18 weeks	n/a
	Parent stock at production farms	>18 weeks	1.9
	Grandparent stock at production farms	>18 weeks	1.9
Turkey farming sector[2]	Toms		n/a
	Hens		n/a
Cattle farming sector[3]	Dairy cattle	>2 years	600
	Heifers	1 - 2 years	440
	Yearlings	56 days - 1 year	235
	Calves (female)	<56 days	56.5
	Beef bulls	>2 years	800
	Beef bulls	1-2 years	628
	Beef bulls	56 days - 1 year	283
	Calves (male)	<56 days	79
Rabbit farming sector	Breeding does/kits	>4 months and <4.5 weeks	8.4
	Weaned meat rabbits	4.5 - 12 weeks	1.8
	Replacement breeding does	12 weeks - 4 months	3.4

[1] Body weights (in kilograms) as determined in consultation with the livestock sectors concerned. They may be adjusted if deemed necessary (e.g. in order to refine the benchmarking method).
[2] As of 2017, the body weights used for determining poultry farms' $DDDA_F$ values are based on the age of the animals at the time of treatment, unless a standardized body weight has been defined for the production category concerned.
[3] Livestock farms in the cattle farming sector are categorized based on whether or not they produce milk. They are classified as either dairy cattle farms or non-dairy cattle farms. Non-dairy cattle farms include rearing farms (with <40% of cattle present being male and none of the animals being over 2 years of age), suckler cow farms (with <40% of cattle present being male and some of the animals being over 2 years of age) and beef farms (with >40% of cattle present being male).

Computational basis for Figure 1 – long-term developments in antibiotic use

- Until 2010, defined daily doses animal were based on data reported by LEI Wageningen UR (DD/AY data). From 2011 onwards, SDa-reported defined daily doses animal ($DDDA_F$ data) have been used.
- The 2011 $DDDA_{NAT}$ values were estimated as follows:
    - For the veal and pig farming sectors: by means of the 2011:2012 $DDDA_F$ ratio (with weighting based on the average number of kilograms present at individual farms);
    - For the dairy cattle farming sector: by means of the 2011:2012 DD/AY ratio;
    - For the broiler farming sector: by means of the 2011:2012 treatment days ratio (with weighting based on the number of animal-days at individual farms).
- Data on the overall number of kilograms of animal in a particular livestock sector, required for calculating the $DDDA_{NAT}$ values, were provided by EUROSTAT (for the pig and dairy cattle farming sectors) and Statistics Netherlands (for the broiler, turkey and veal farming sectors).
- 95% confidence intervals were based on the corresponding confidence intervals for the weighted $DDDA_F$ values.

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Appendix to the report
Usage of Antibiotics in Agricultural Livestock in the Netherlands in 2019
Trends and benchmarking of livestock farms and veterinarians
SDa/1153/2020
The Netherlands Veterinary Medicines Institute, 2020