

**Supplementary Table 1.** Essential antimicrobials used in the study farms

<b>Antimicrobial</b>	<b>N = 199 n (%)</b>	<b>Median (IQR)</b>	<b>Range*</b>
<b>Antibiotics</b>			
Oxytetracycline	131 (65.8)	2 (1 - 4)	1 - 15
Tetracycline	3 (1.5)	2	1 - 3
Doxycycline	11 (5.5)	3 (2 – 10)	1 - 15
Clotetracycline	2 (1.5)	4	1 - 7
Oxytetracycline-Neomycin	24 (12.1)	1 (1 – 4)	1 - 8
Tetracycline-colistin	2 (1.5)	1	1 - 2
Doxycycline- tylosin	61 (30.7)	2 (1 – 3)	1 - 10
Doxycycline-colistin	19 (12.3)	1 (1 – 3)	1 - 7
Doxycycline-genta	11 (5.5)	1 (1 – 3)	1 - 11
Tylosin	20 (10.1)	1 (1 – 3)	1 - 8
Ciprofloxacin	7 (2.5)	1 (1 - 3)	1 - 6
Enrofloxacin	46 (23.1)	2 (1 -3)	1 - 7
Norfloxacin	11 (5.5)	3 (1 – 4)	1 – 10
Gentamicin	2 (1.5)	3	3 - 5
Trimethoprim-sulfamethoxazole	23 (11.6)	2 (1 – 5)	1 - 13
Trimethoprim-sulfadiazine	23 (11.6)	1 (1 – 2)	1 - 10
Sulfadimidine-diaveridine	8 (4.0)	2 (1 – 3)	1 - 4
Sulfadimerazine-sulfadiazine	4 (2.0)	1 (1 – 3)	1 - 3
Amoxicillin	3 (1.5)	1	1

Amoxicillin-colistin	4 (2.0)	1 (1-2)	1 - 2
Erythromycin	1 (0.5)	4	4
Enrofloxacin-colistin	1 (0.5)	1	1
Neomycin-cholompenicol-ocytetracycline	1 (0.5)	2	2
<b>Antiparasites</b>			
Amprolium	54 (27.1)	2 (1 – 3)	1 - 7
Toltrazuril	7 (3.5)	1 (1 – 2)	1 - 9
Ivermectin	5 (2.5)	1 (1 – 2)	1 - 2
Piperazine	10 (5.0)	1 (1 – 3)	1 – 4
Levamisole	13 (6.5)	1 (1 – 3)	1 - 5

\*minimum and maximum frequency of treatment regimens

**Supplementary Table 2.** Distribution of treatment regimens with each of antibiotic classes among farms by chicken age group composition

	<b>Laying</b> n (mean rank*)	<b>Pullets</b> n (mean rank*)	<b>Chicks</b> n (mean rank*)	<b>Laying+Pullets</b> n (mean rank*)	<b>Laying+Chicks</b> n (mean rank*)	<b>Laying+Pullet s+Chicks</b> n (mean rank*)	<i>P</i> value
Tetracyclines	104 (84.7)	12 (100.3)	10 (107.6)	15 (70.9)	21 (84.0)	9 (87.9)	.476
Macrolides	46 (42.3)	9 (32.9)	4 (39.0)	4 (36.3)	12 (35.1)	4 (48.5)	.734
Fluoroquinolones	38 (32.2)	6 (34.3)	3 (32.2)	6 (35.8)	8 (28.3)	2 (24.3)	.949
Sulphonamides	33 (27.2)	5 (38.9)	2 (26.8)	3 (13.0)	9 (31.5)	3 (24.2)	.277
Diaminopyrimidines	24 (21.4)	5 (24.9)		2 (9.5)	9 (22.4)	2 (22.0)	.628
Aminoglycosides	24 (17.6)	2 (17.5)	1 (33.5)	3 (11.0)	4 (20.3)	1 (24.0)	.363
Polymixins	23 (17.9)	1 (21.0)		3 (9.0)	4 (9.0)		.084
Penicillins	5 (4.6)			1 (2.5)	1 (2.5)		.407

\* Kruskal-Wallis H test

**Supplementary Table 3.** Practices related to antibiotic use

<b>Statement</b>	<b>Correct response n (%)</b>	<b>Incorrect response n (%)</b>
Did you call for animal health expert in the last 12 months? (Yes)	132 (64.4)	73 (35.6)
Did you use laboratory services, for example, taking a sick or dead chicken to the laboratory in the last 12 months? (Yes)	78 (38.0)	127 (62.0)
What did you do with your layers when they fell sick? (Correct statement: <i>Consult animal health professional</i> )	113 (55.1)	92 (44.9)
How did you decide on the drug you used for treatment? (Correct response: <i>Advice from animal health professional/agrovet</i> )	136 (66.3)	69 (33.7)
Do your treatment choices differ for layers of different ages? (Yes)	81 (39.5)	124 (60.5)
Who administered the first most commonly used drug the last time you used it? ( <i>Animal health service provider</i> )	16 (7.8)	189 (92.2)
Who administered the second most commonly used drug the last time you used it? ( <i>Animal health service provider</i> )	14 (6.8)	191 (93.2)
Which chickens were given the first most commonly used drug the last time you used it? ( <i>All chickens</i> )	167 (81.5)	38 (18.5)
Which chickens were given the second most commonly used drug the last time you used it? ( <i>All chickens</i> )	178 (86.8)	27 (13.2)
Where did you obtain the first most commonly used drug from? ( <i>From animal health service provider/agrovet</i> )	203 (99.0)	2 (1.0)
Where did you obtain the second most commonly used drug from? ( <i>From animal health service provider/agrovet</i> )	203 (99.0)	2 (1.0)
How did you know how to use the first most commonly used drug? ( <i>From animal health service provider/agrovet</i> )	181 (88.3)	24 (11.7)
How did you know how to use the second most commonly used drug? ( <i>From animal health service provider/agrovet</i> )	170 (82.9)	35 (17.1)
Where specifically do you normally keep the first most commonly used drug (s) bought? (in a cabinet/cupboard/shelf/specific container)	141 (68.8)	64 (31.2)
Where specifically do you normally keep the second most commonly used drug (s) bought? ( <i>in a cabinet/cupboard/shelf</i> )	141 (68.8)	64 (31.2)
Do you keep records of treatments of your chicken (layers)? (Yes)	92 (44.9)	113 (55.1)
What do you do with eggs collected from layers under and after a few days after treatment? (stop selling/human consumption)	9 (4.4)	196 (95.6)

Do you stop selling eggs when you use antibiotics? ( <i>Yes</i> )	17 (4.4)	196 (95.6)
Do you stop consuming eggs when you use antibiotics? ( <i>Yes</i> )	32 (15.6)	173 (84.4)
What do you do if sick layers under treatment do not improve?(Consult animal health professional)	53 (25.9)	152 (74.1)
What do you do if sick layers under treatment die a few days after treatment? (burry)	125 (61.0)	80 (39.0)
What do you do with expired drugs? (taking them back to the agrovet shop/municipal)	13 (6.3)	192 (93.7)

<b>Supplementary table 4. Knowledge related to antibiotic use</b>		
<b>Statement</b>	<b>Correct response n (%)</b>	<b>Incorrect response n (%)</b>
Do you know what antibiotics are? ( <i>Yes</i> )	177 (86.3)	28 (13.7)
Do your treatment choices differ for layers of different ages? ( <i>Yes</i> )	81 (39.5)	124 (60.5)
If YES: Why do your treatment choices differ? (correct statement: <i>Some drugs are not appropriate to certain chicken age</i> )	31 (38.3)	50 (61.7)
What are the reasons to stop using an antibiotic? ( <i>End of treatment course</i> )	129 (62.9)	76 (37.1)
Do you know what withdrawal time is? ( <i>Yes</i> )	103 (50.2)	99 (48.3)
How would you define withdrawal time? (n = 103) ( <i>Correct definition: time interval from administration of a antimicrobial agent to animal until consumption of animal product to assure that drug residues are below the maximum residue limit</i> )	86 (83.5)	17 (16.5)
How do you identify expired antibiotics?( <i>correct response: through the printed expiry date</i> )	189 (92.2)	16 (7.8)

**Supplementary table 5.** Attitude related to antibiotic use

<b>Statement</b>	<b>Agree</b>	<b>Disagree</b>
Drugs are expensive so you should use them for as long as you can	113 (55.1)	92 (44.9)
It is not reasonable to throw away eggs from chicken during or directly after treatment with antibiotics	138 (67.3)	67 (32.7)
Antibiotics should be used only for the purpose of curing diseases	116 (56.6)	89 (43.4)
Antibiotics may become less effective due to AMR	38 (18.5)	167 (81.5)