

Isolation of bacteria from the gastrointestinal tract of broiler chickens and screening for bacteriocin production

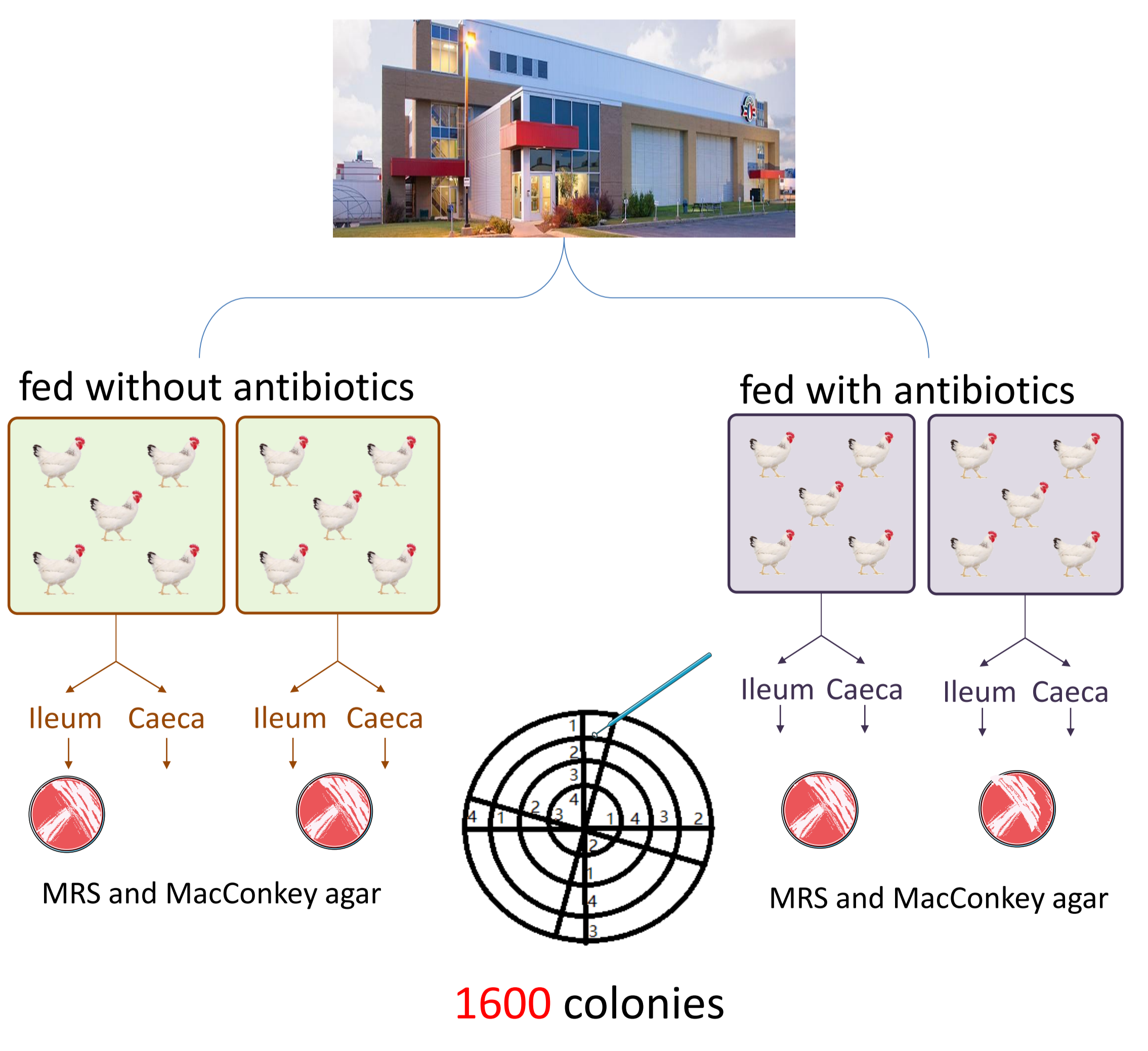
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Introduction

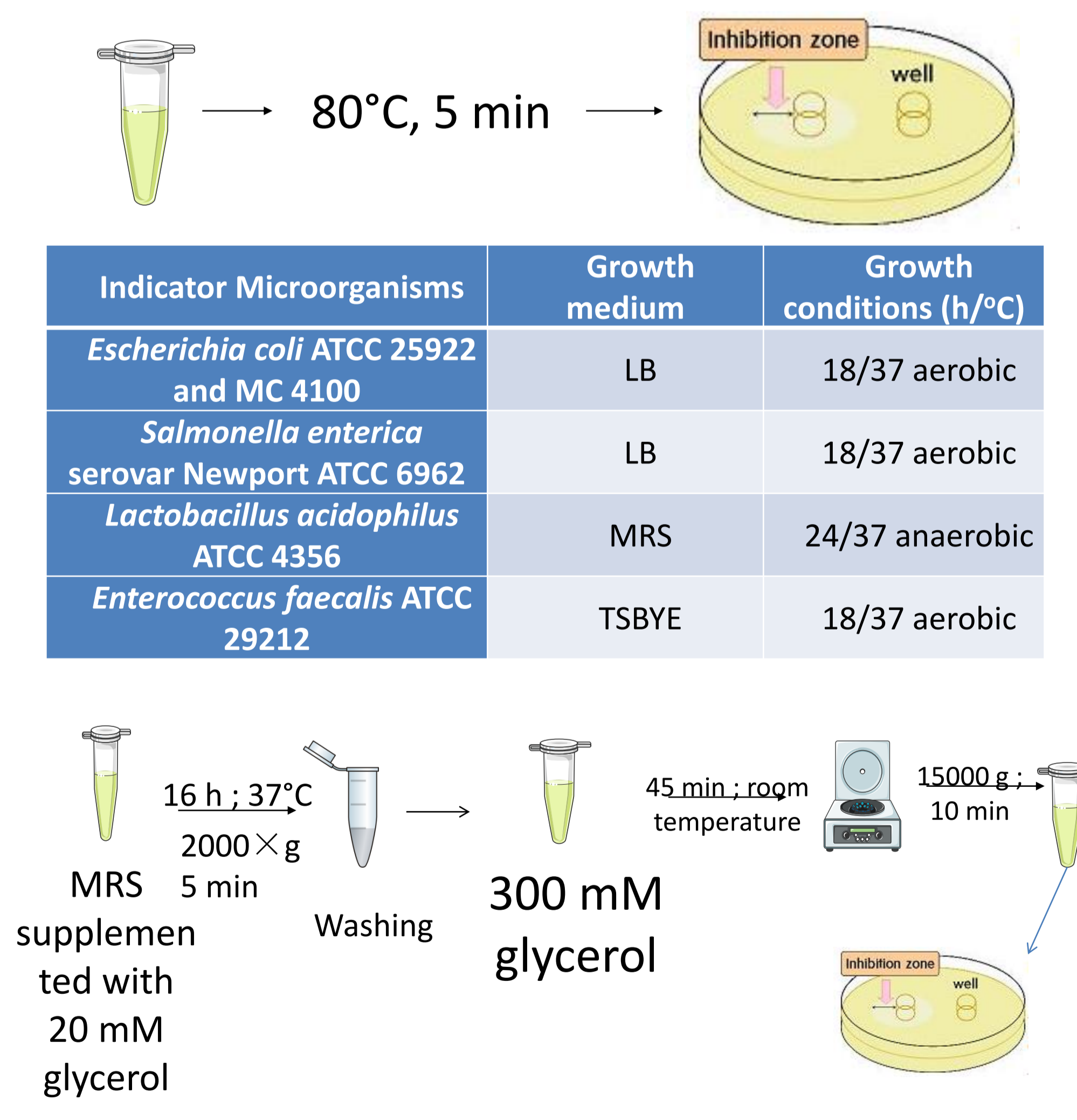
Antibiotics have been used to improve growth and health in poultry industry for many years. However, the wider use of antibiotics as feed additives can contribute to the development of resistant bacteria to drugs. These bacteria with resistant genes pose a potential risk for humans if they are transferred to persons¹. As the European Union banned antibiotics as animal growth promoter in livestock production, the interest in searching for alternatives to antibiotics has been increased in recent years. Bacteriocins, which are ribosomally synthesized antimicrobial peptides, present antimicrobial activity against bacterial species that are closely related to the producer strain². These peptides having advantages over antibiotics could potentially be used in the food and feed industries as natural preservatives and as probiotics for humans and livestock³. Thus, the aim of this study was to isolate and screen the bacteriocin-producing bacteria from the gastrointestinal tract of broiler chickens for improving health and growth of poultry.

Methods

1. Isolating

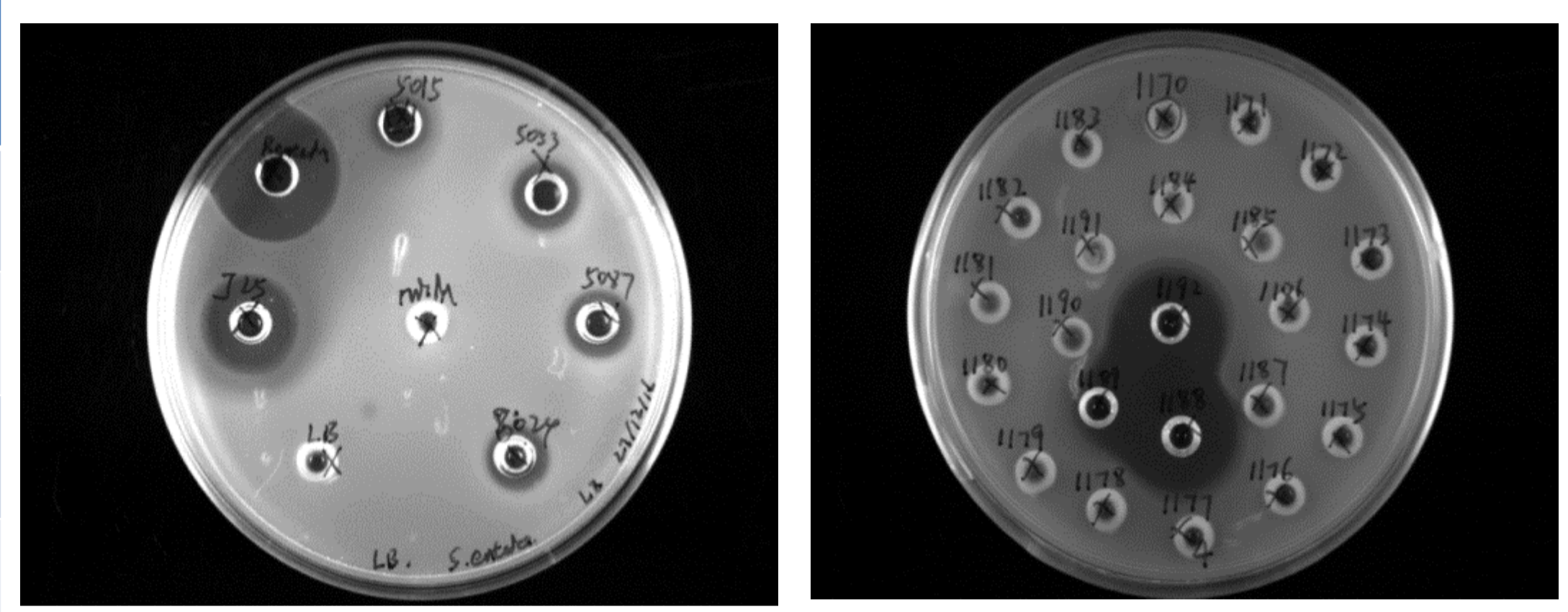


2. Screening



Results & Discussion

	Without antibiotics (sum/positive)		With antibiotics (sum/positive)	
	Ileum	Caecum	Ileum	Caecum
G-	200 (1)	200 (25)	200 (19)	200 (15)
G+	200 (27)	200 (0)	200 (3)	200 (1)
G+ (reuterin)	200 (3)	N	N	N



N: not yet complete

Strain No.	Source	Stain	Inhibitory activity (mm)		Strain No.	Source	Stain	Inhibitory activity (mm)
			<i>E. coli</i>	<i>S. enterica</i>				<i>S. enterica</i>
5015	Ileum	Gram-	9	8	1188	Ileum	Gram+	20
5053	Ileum	Gram-	10.5	13	1189	Ileum	Gram+	14
5087	Ileum	Gram-	12.5	13.5	1192	Ileum	Gram+	20

The 16s rDNA sequences of strains (5015, 5053, 5087) revealed 99% similarity with *Escherichia coli*

Conclusion

Bacteriocins produced by the six selected strains that show antibacterial activity have potential to be used in controlling enteric pathogens and reducing the colonization by bacteria in the gastrointestinal tract in poultry. Further screening and characterization of the bacteriocin-producing strains are necessary to investigate.

Reference

- Castanon, J. I. R., History of the use of antibiotic as growth promoters in European poultry feeds. *Poultry Science* 2007, 86 (11), 2466-2471.
- Caly, D. L.; D'Inca, R.; Auclair, E.; Drider, D., Alternatives to Antibiotics to Prevent Necrotic Enteritis in Broiler Chickens: A Microbiologist's Perspective. *Frontiers in Microbiology* 2015, 6.
- Shin, M. S.; Han, S. K.; Ji, A. R.; Kim, K. S.; Lee, W. K., Isolation and characterization of bacteriocin-producing bacteria from the gastrointestinal tract of broiler chickens for probiotic use. *Journal of Applied Microbiology* 2008, 105 (6), 2203-2212.

Acknowledgment

