"The Future Without Antibiotics: A Wake-Up Call"

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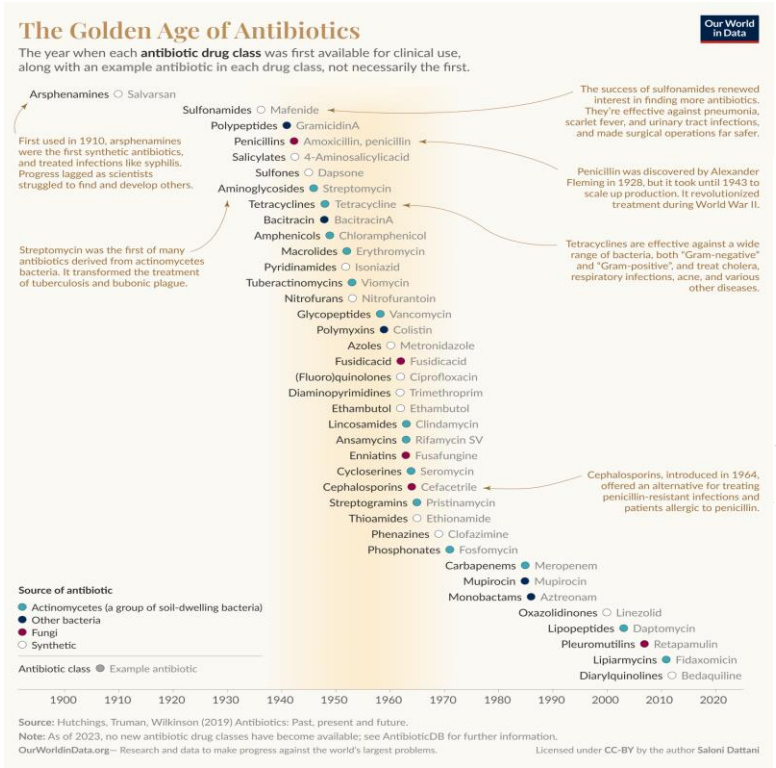
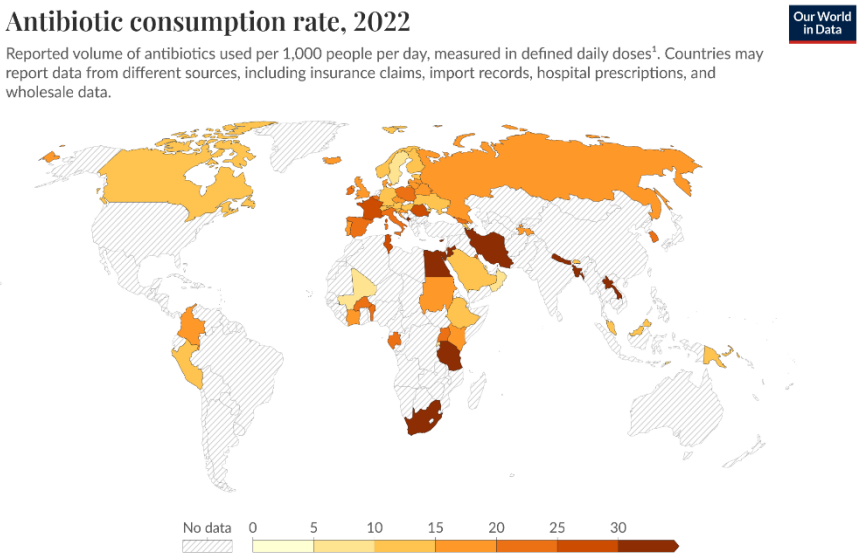
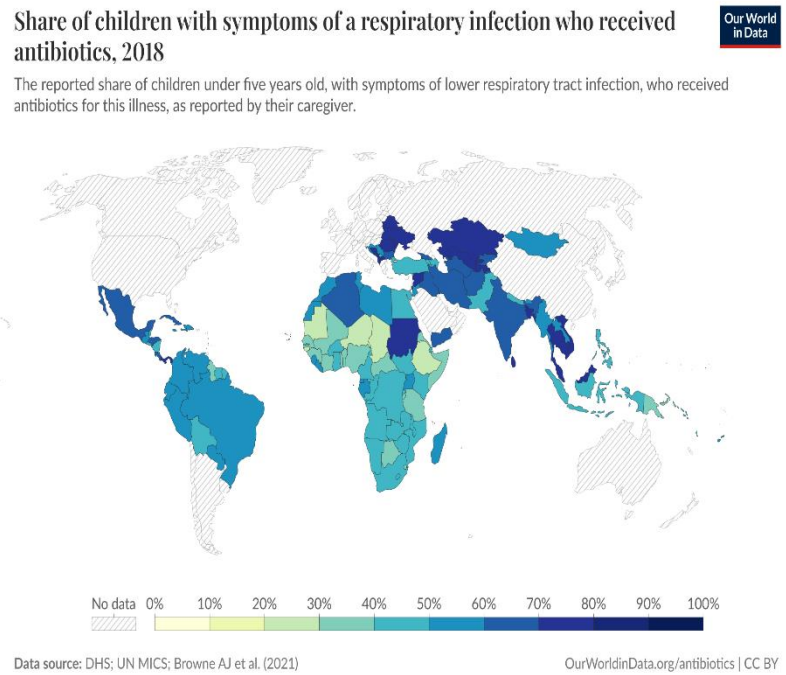
INTRODUCTION

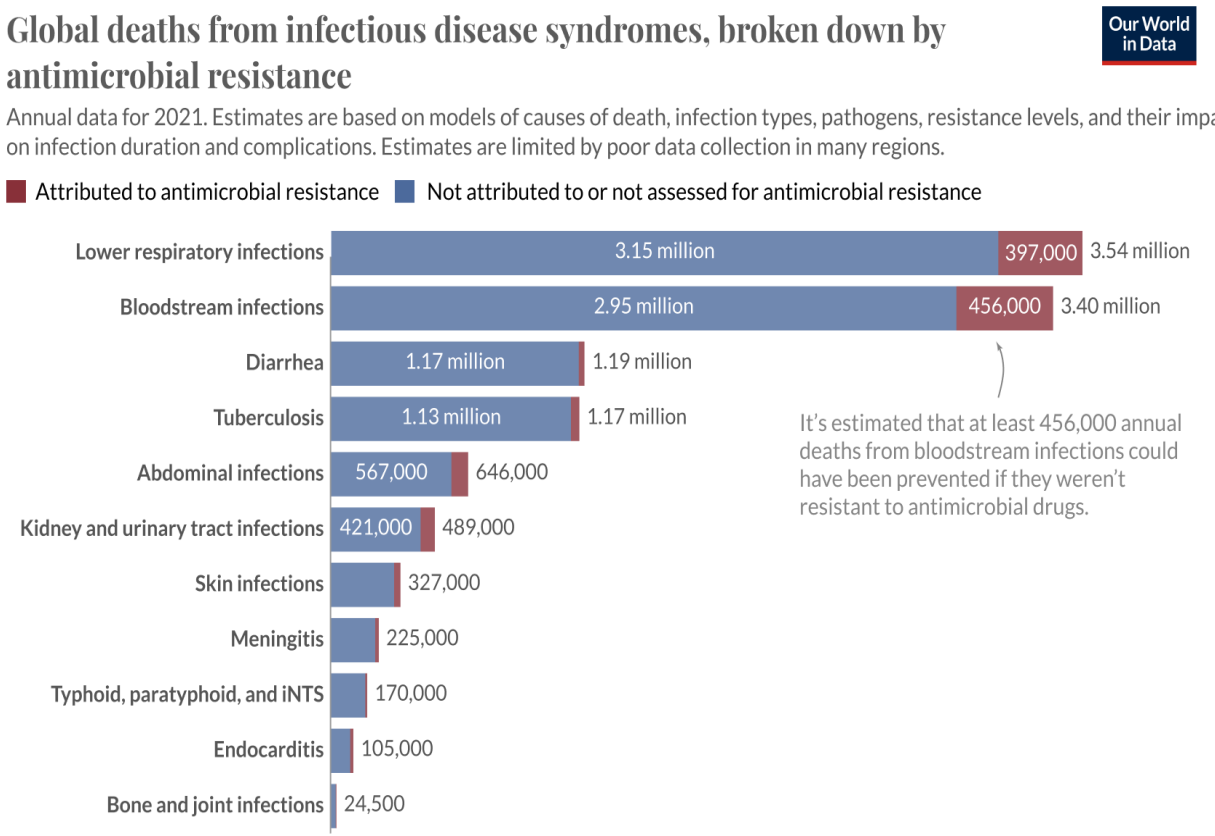
Antibiotics development and current patterns of usage



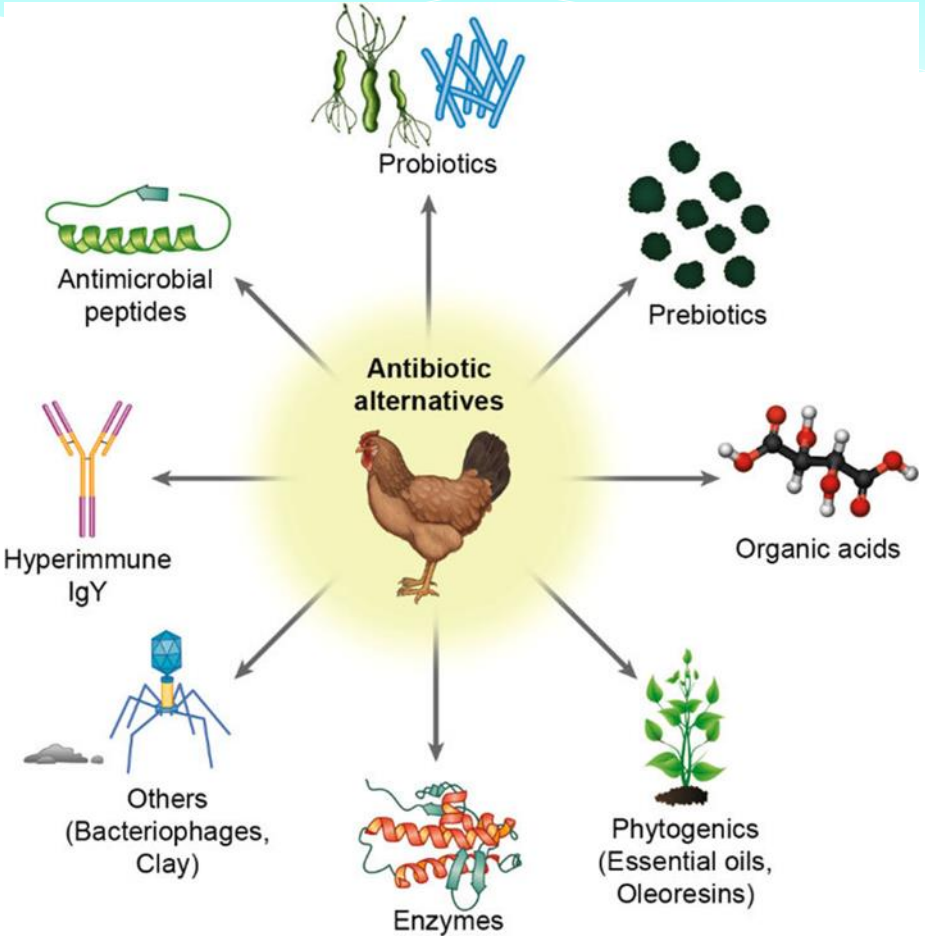




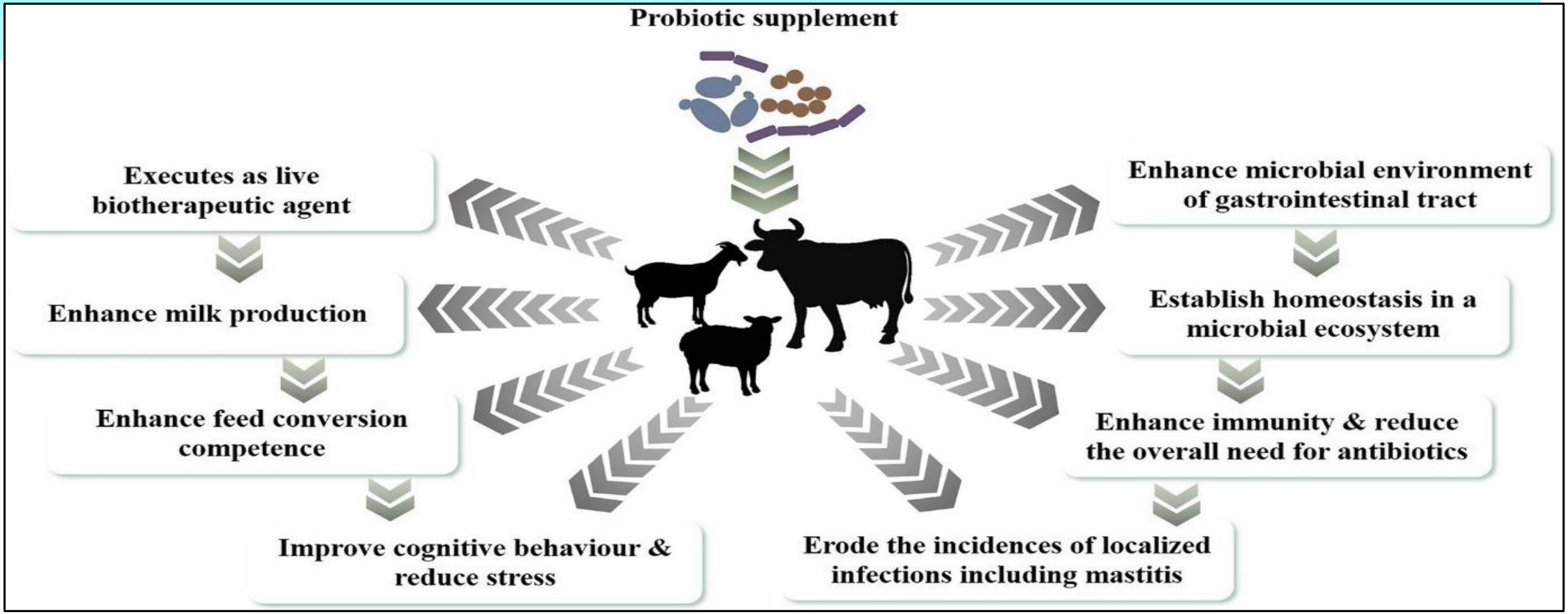
INTRODUCTION



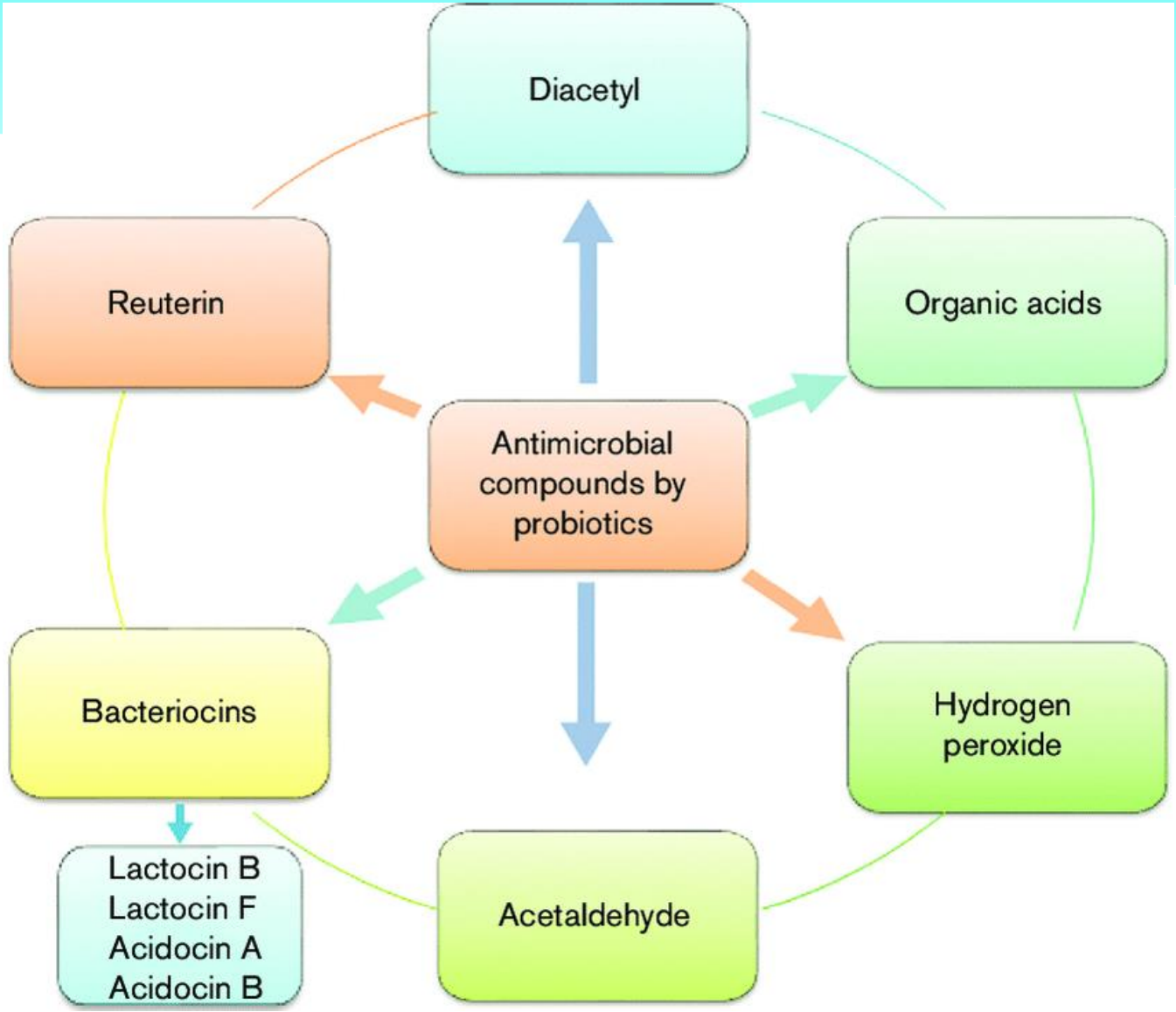
INTERVENTIONS



“Probiotics are live microorganism which, when administered in adequate amounts8 confer a health benefit on the host”(FAO/WHO)



Why do probiotics exhibit antibiotic- like properties?



Mongolian probiotic formulations and indigenous strains

✓ Probiotic formulation technology

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A technology has been developed for a probiotic-enriched formulation containing 11.25% total protein, nine essential minerals (Al, Ca, Cu, Fe, K, Mg, Mn, Na, and P), and a combination of *Lactobacillus casei*, *Lactobacillus fermentum*, and *Lactobacillus plantarum* at a concentration of no less than 3 × 10^8 CFU/mL. This formulation is intended to enhance the immune status of neonatal and juvenile livestock, promote growth, and prevent and treat gastrointestinal infections.

“MONSUBTIL”

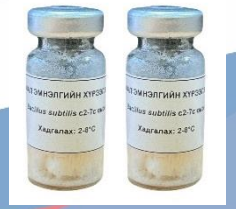
This probiotic formulation contains *Bacillus subtilis* C2-7c, isolated from the gastrointestinal tract of grazing sheep, at a concentration of 3 × 10^8 CFU/g and 40% total protein. It is designed to regulate the balance of intestinal microbiota in neonatal and juvenile livestock and to promote growth by enhancing enzymatic activity.

✓ Indigenous probiotic strains

Strains of lactic acid bacteria isolated from goat colostrum: *Lactobacillus casei* 1ca, *L. helveticus* 11h, *L. fermentum* 17f, *L. plantarum* 23p, and *L. delbrueckii* subsp. *bulgaricus* 48d."

"Strains of propionic acid bacteria isolated from the ruminant digestive tract: *Propionibacterium acidipropionici* and *P. acnes*."

Strains of carotenoid-producing *Flavobacterium* spp. isolated from the ruminant digestive tract.



*Bacillus subtilis c*2-7c

Antagonistic activity of probiotic strains

№	Indigenous probiotic strains	The extent of growth inhibition of pathogenic strains and the formation of the inhibition zone (mm)			M±m
		E.coli 10963	*Sal. 14028*	*S..aureus 5695*	
1	*L.helveticus 11h*	22	25	23	23.3±2
2	*L.plantarum 23p*	26	25	24	25±1
3	*Propionibacterium acidipropionici - Prop. acid2*	24	23	22	23±1
4	*Propionibacterium acnes - Prop. acnes4*	22	23	22	22.3±0.5
5	*Flavobacterium spp.F5*	**27**	12	**31**	23.3±3.5
6	*Flavobacterium spp.F69*	**26**	12	**28**	22±3
	M ±m	24.5±2	20±6	25±3.6	

Table 1. Results of the antagonistic activity of probiotic strains used in the study against intestinal pathogens

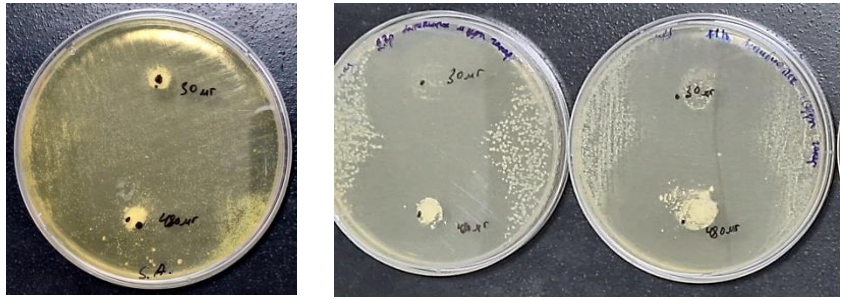


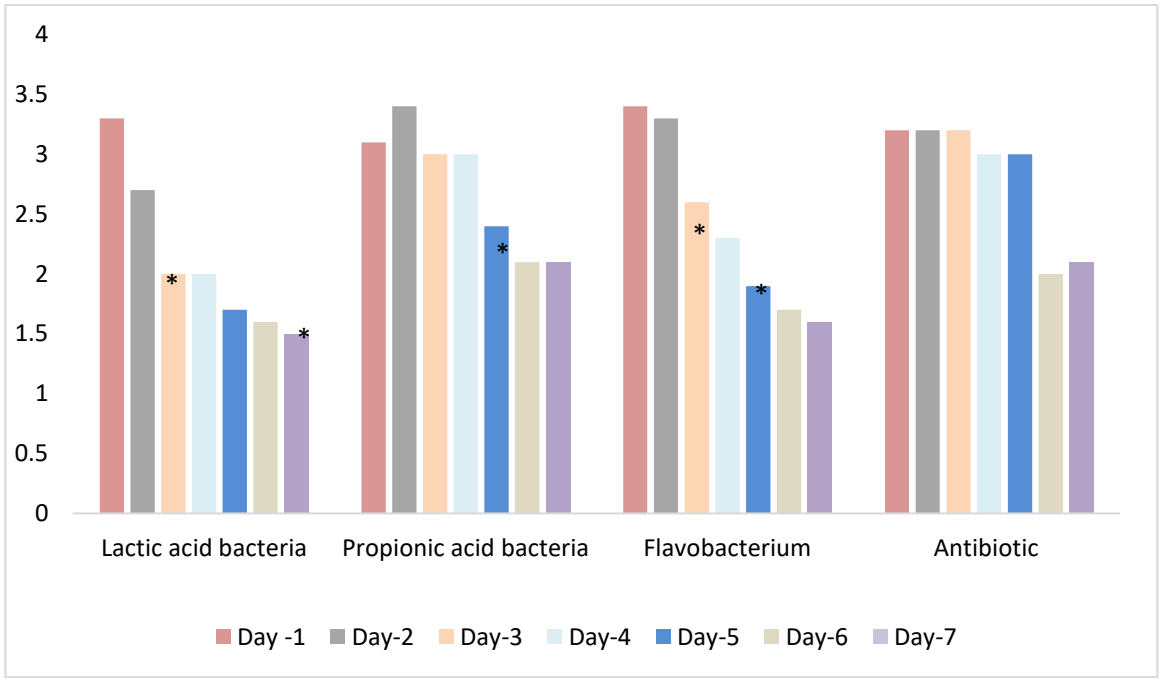
Figure 1. Antibiotic susceptibility of *E. coli* and *S. aureus* to Bimodine bolus

Figure 2. Antagonistic activity of indigenous lactic acid bacterial strains.

Figure 3. Antagonistic activity of indigenous propionic acid bacterial strains

Figure 4. Antagonistic activity of indigenous *Flavobacterium* spp. strains.

Effect of probiotic treatment in calves exhibiting diarrhea symptoms



Graph 1. Evaluation of calf feces during the experimental period (by day)"
Legend: 1 – normal solid, 2 – soft, 3 – very loose, 4 – watery

Figure 9. Consistency of calf feces before, during, and after treatment

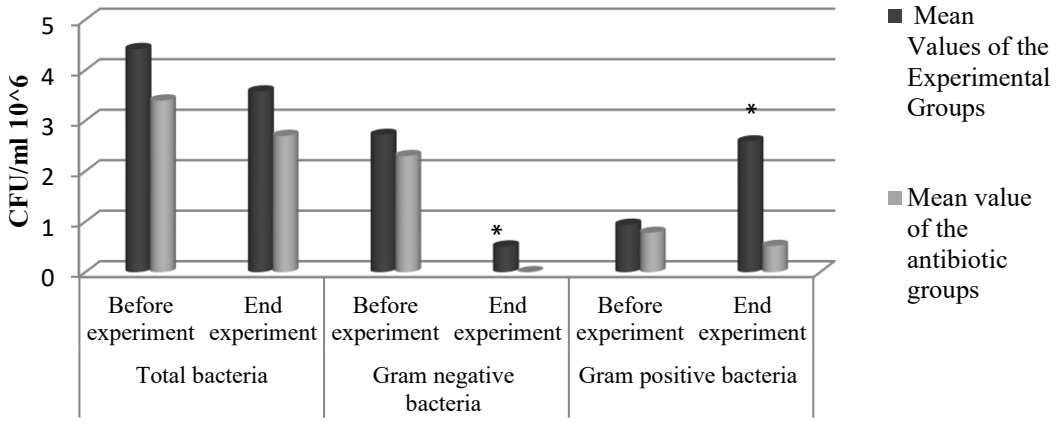
Figure 10. Calf Health Scoring Guide Created by the University of Wisconsin-Madison School of Veterinary Medicine

Bacteriological analysis of calf feces:

№	Group	Farm 1			Farm 2		
		Total Bacteria CFU/ml x 10^6	Gram negative bacteria CFU/ml x 10^6	Gram-positive bacteria CFU/ml x 10^6	Total Bacteria CFU/ml x 10^6	Gram negative bacteria CFU/ml x 10^6	Gram-positive bacteria CFU/ml x 10^6
1	*Lactic acid bacteria*	2.79	*0.3	*1.6	*2.6	*0.2	*2.24
2	*Propionic acid bacteria*	4.0	1.8	*1	*4.8	1.8	*2.02
3	*Flavobacterium spp.*	3.1	*0.2	*2.8	*3.7	*0.6	*3
4	*Antibiotic*	2.4	1	0.45	3	1.2	0.6
	Before experimental	4,3	2,7	0,79	4,1	2,5	1,05

(*p<0.05)

Table 5. Bacteriological analysis of calf feces before the experiment, prior to treatment, and at the end of the trial



Graph 2. Total bacterial counts and counts of Gram-positive and Gram-negative bacteria in calf feces

“Use antibiotics wisely today, embrace alternatives, and protect tomorrow’s health”

“Өнөөдөр антибиотикийг ухаалгаар хэрэглэж, альтернатив боломжуудыг ашиглаж маргаашийн эрүүл мэндээ хамгаалаарай”

Thank you for your attention