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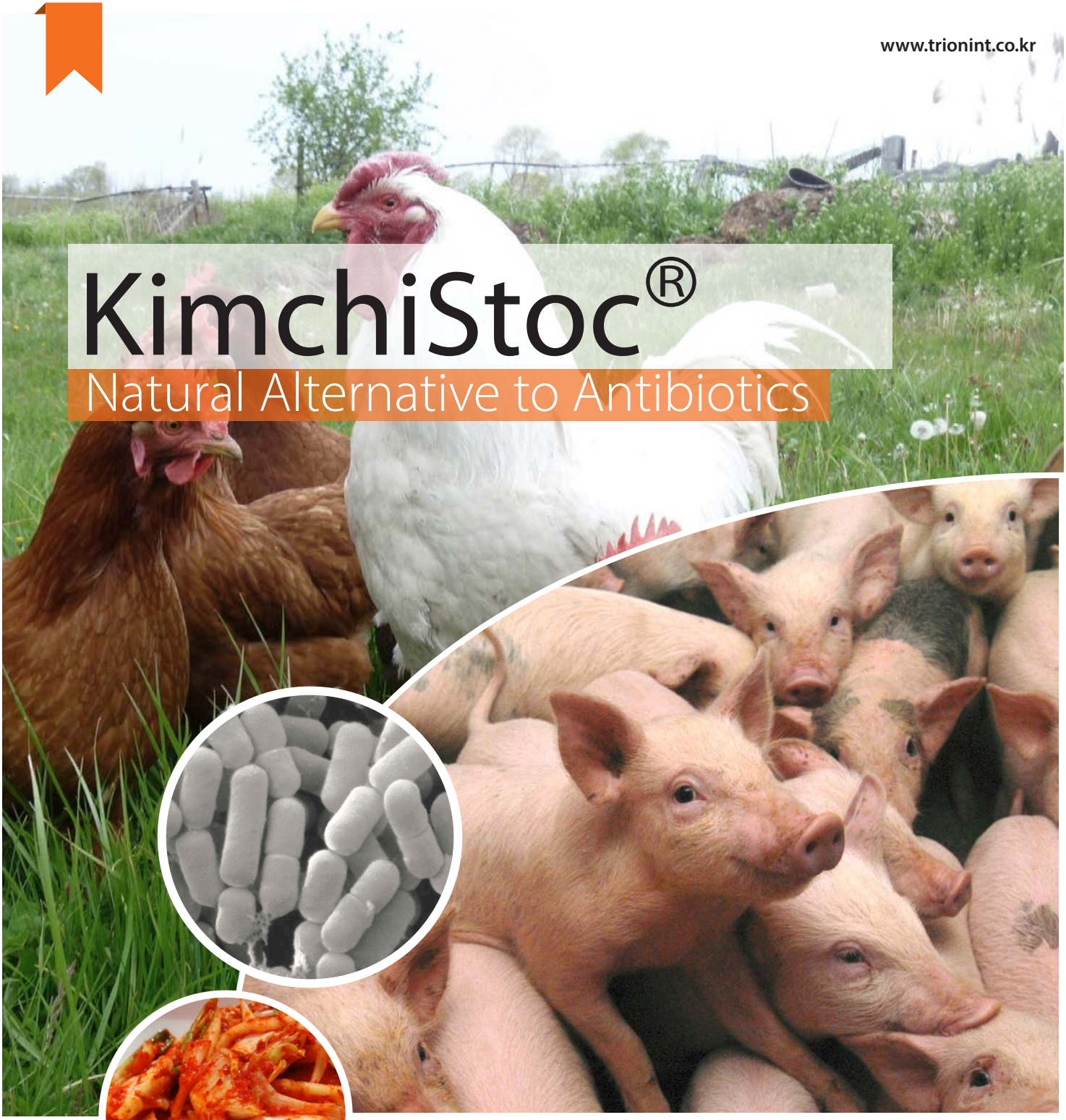
KimchiStoc®

Natural Alternative to Antibiotics



- Powerful Antibacterial & Antiviral Agent
- Immune Stimulator
- No Toxicity, No Residue
- Productivity Accelerator

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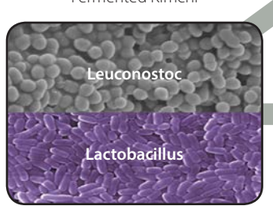
· KimchiStoc is a new concept of **Growth Promoter** which is **Natural Alternative to Antibiotics** derived from Korean Kimchi probiotics!

What is KimchiStoc?

• KimchiStoc contains fermented metabolites of lactic acid bacteria culture originated from Korean Kimchi which has strong anti-bacterial and antiviral activities. KimchiStoc is a powerful antibiotic alternatives and a natural product that has synergistic effect with antibiotics against to bacterial & viral disease.

Fermented Kimchi

Isolation



Kimchi Lactic acid bacteria

Cultivation

KimchiStoc®

- **Anti-bacterial Effect**
- **Anti-viral Effect**

Why KimchiStoc?

- Increased prevalence of Antibiotic resistance
- Antibiotic residue problem in egg and meat
- Consumer's need for food safety
- Increasing demand for antibiotic alternative

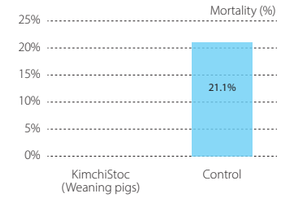
Advantages

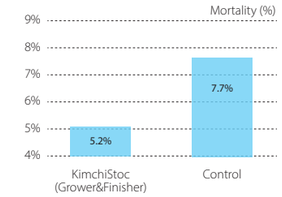
- Powerful antibacterial & antiviral activity
- No toxicity, No residual problem
- Synergetic effect with antibiotics against bacterial & viral disease
- Decreasing mortality & Preventing disease
- FCR Improvement & Growth, Productivity acceleration
- High stability to heat(100℃ for 24h) and pH(3-5)

Filed trial test : Swine

<Growth performance and disease prevention in Pig>

Index	Weaning pigs		Grower & Finisher	
	Test Group		Test Group	
	KimchiStoc	Control	KimchiStoc	Control
Number at start(head)	96	38	231	285
Death(head)	0	8	12	22
Mortality	0%	21.1%	5.2%	7.7%
Causative agents	-	PMWS	PRDC	PRDC
Avg. weight per head at beginning (kg)	5.5	6.0	26.3	25.3
Avg. weight per head at the end (kg)	26.0	24.1	109.4	108.3
Total feed intake(kg)	3,640	1,178	82.8	83.0
Feed intake per head(kg)	37.9	39.3	237.6	250.1
Avg. weight gain per head(kg)	20.5	18.1	82.8	83.0
Feed efficiency(FCR)	1.85	2.17	2.87	3.01





Filed trial test : Poultry

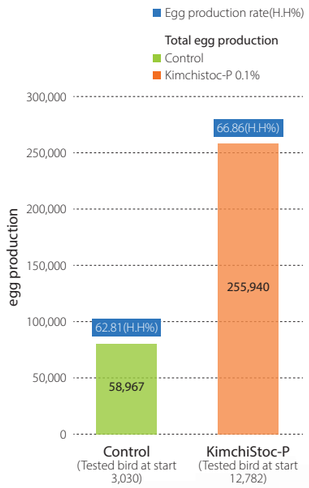
<Broiler : Effect of KimchiStoc on Broiler productivity>

	Control	KimchiStoc 0.1%
No. of start	32,000 birds	38,000 birds
No. of dead	2,100	700
Viability	93.4%	98.2%
Final weigh (Avg)	1,539g	1,564g
Feed consumption (Avg)	2,493g	2,423g
Harvest day	32 days old	32 days old
FCR	1.62	1.55
PI Index	277	310

<Layer : Effective of KimchiStoc on Egg production>

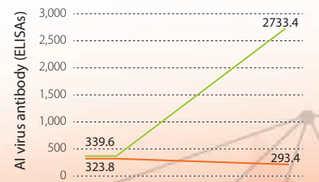
	Control	KimchiStoc-P 0.1%
No. of tested bird	3,030	12,782
Duration, day	35	35
No. of total egg production	58,967	255,940
Egg production rate (H.H%)	62.81	66.86

*from 37weeks to 41weeks old, KimchiStoc 1kg/ton of feed



<Breeder : Avian influenza virus Antibody titer>

		Control	KimchiStoc-P 0.1%
AI (H9N2) Antibody titer (ELISAs, mean)	Before	339.6	328.8
	After	2,733.40	293.4



Dosage

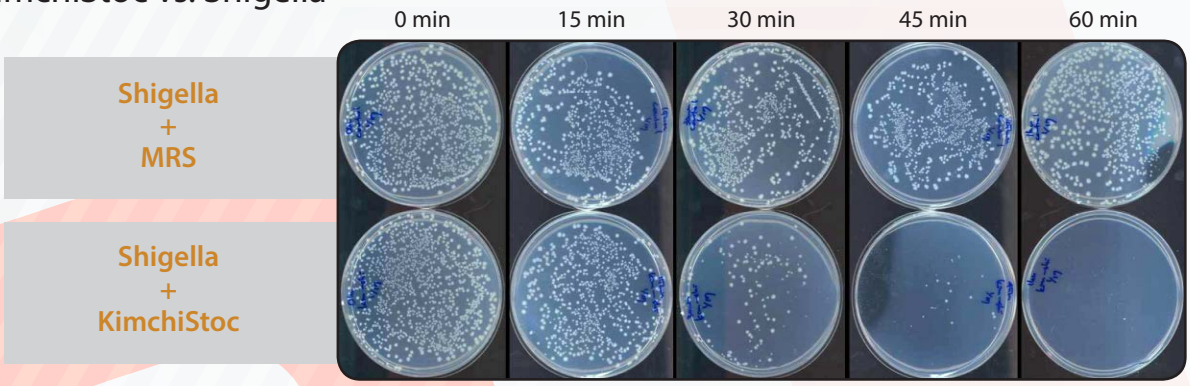
	Disease Prevention	Disease Treatment Aid
Poultry	1L/ton of drinking water	1-2L/ton of drinking water
Swine	1-2kg/ton of feed	2-4kg/ton of feed

Anti-bacterial effect of KimchiStoc

KimchiStoc vs. E.Coli

Leuconostoc spp. + E. coli

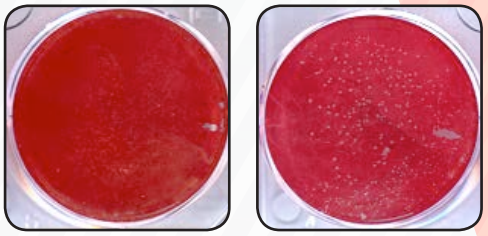
KimchiStoc vs. Shigella



Anti-viral effect of KimchiStoc

KimchiStoc vs. Human influenza

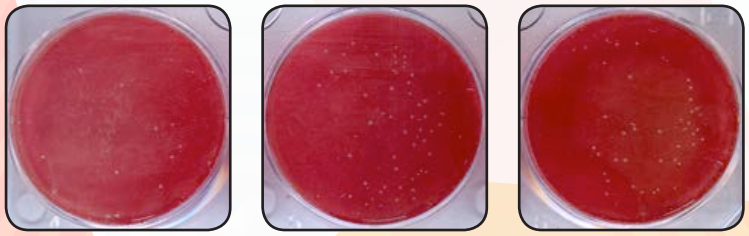
+ State of serious infection



Control-1
- Host

Control-2
- Host + Virus

+ State of low infection



0.1X **0.01X** **0.001X**

Host cell line: MDCK(NBL-2)

KimchiStoc vs. AI virus (H9N2)

Material : KimchiStoc-L

Result :

Dilution rate of material	No. of eggs of positive for AIV / No. of hatching eggs inoculated AI virus					
	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}
200 X	0/5	0/5	0/5	0/5	0/5	0/5
300 X	0/5	0/5	0/5	0/5	0/5	0/5
500 X	4/5	0/5	0/5	0/5	0/5	0/5
1,000 X	5/5	5/5	5/5	1/5	0/5	0/5

Patent certificate for Antiviral & Antibacterial

Patent protection (Korean patent & PCT application for overseas

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