

Acknowledgements

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List of abbreviation

ANOVA : Analysis of variance

BALF : Bronchoalveolar lavage fluid

bp : Base pair

C : *Clostridium*

CFU : Colony forming unit

Ct : Threshold cycle

DAPI : 4', 6-diamidino-2-phenylindole

DMEM : Dulbecco modified eagle's medium

FAO : Food and agriculture organization of the united nation

FBS : Fetal bovine serum

IFN : Interferon

IFV : Influenza virus

IL : Interleukin

Ig : Immunoglobulin

L : *Lactobacillus*

LAB : Lactic acid bacteria

LDH : Lactate dehydrogenase

Lc : *Lactococcus*

LPS : Lipopolysaccharide

MCP : Monocyte chemotactic protein

MDCK : Madin Darby canine kidney cells

mLBS : Modified LBS agar

MRS : Man, Rogosa and Sharpe

NK : Natural killer

PBS : Phosphate buffered saline

PFU : Plaque forming units

RANTES : Regulated on activation normal T cell expressed and secreted

RAPD : Random amplified polymorphic DNA

rDNA : Ribosomal DNA

RPMI : Roswell park memorial institute

RT : Reverse transcription

S : *Streptococcus*

SCFA : Short chain fatty acids

ssp : Subspecies

TLR : Toll-like receptor

TNF : Tumor necrosis factor

Th : T-helper

Treg : Regulatory T cell

W : *Weissella*

WHO : World health organization