

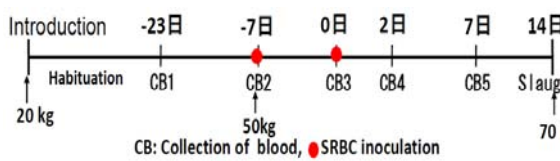
## INTRODUCTION

Selection for low *mycoplasma pneumoniae* (MPS) lesions in Landrace pig during five generations was conducted at the Miyagi Prefecture Livestock Experiment Station. Nippon Meat Packers Inc. selected for peripheral-blood immunity, phagocyte activity (PA), complement alternative pathway activity (CP) and antibody productivity against swine erysipelas vaccine (ABP) of Large White pigs during six generations. This study investigates the immunogenic properties of both purebred and crossbred pigs to assess the feasibility of breeding for disease resistance in pigs.

## MATERIALS AND METHODS

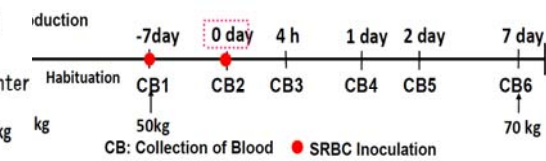
### Experiment 1. Purebred comparison

Landrace	Large white
10 (Castrate: 6, Gilts: 4)	10 (Castrate: 4, Gilts: 6)

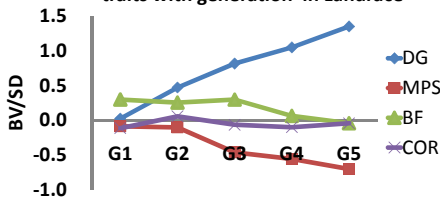


### Experiment 2. Crossbred comparison

Selected F <sub>1</sub> (LW)	Control F <sub>1</sub> (LW)
5 (Castrate: 4, Gilts: 1)	5 (Castrate: 5)

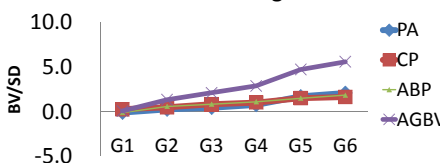


Change of breeding value of selection traits with generation in Landrace



The Landrace had been selected for DG, BF, MPS, COR. BV of MPS significantly decreased.

Change of breeding value of selection traits in Larger White



The Large White breed had been selected for PA, CP, and ABP. AGBV: Aggregated breeding value

Landrace



Large white



Crossbred LW

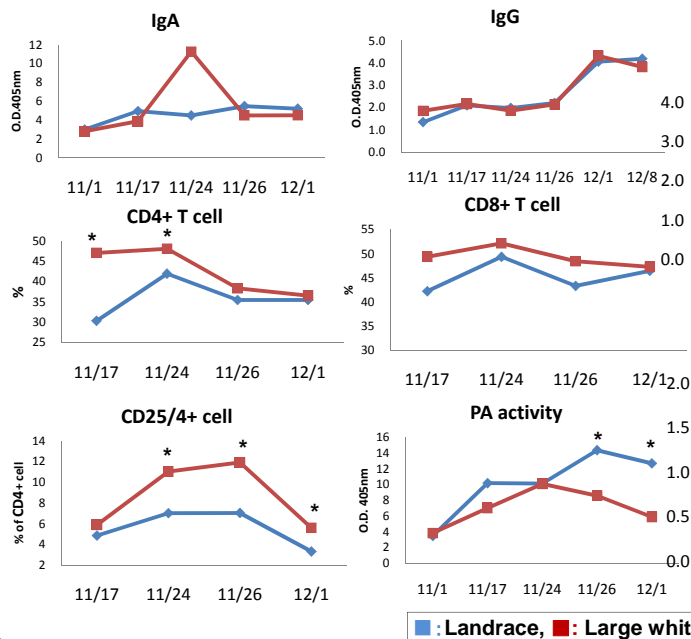


### Immune traits measurement

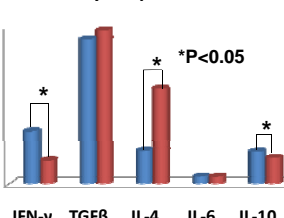
Immune traits	Method
• White blood cell number (WBC)	Autohemolytic counter
• Phagocytosis activity	Chemiluminescence method
• Granulocyte/Lymphocyte ratio	Light microscopy of the blood smear
• CD4 and CD8 expression in T cells	FACSCaliber flow cytometer
• SRBC-specific IgG, IgM	Enzyme-linked immunosorbent assay
• Total IgA in saliva	Pig IgA ELISA Quantitation Kit
• Cortisol concentration	Enzyme Immunoassay
• Cytokine expression	Quantitative real-time PCR

## RESULTS

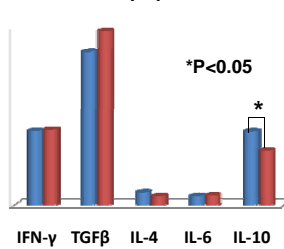
### Experiment 1. Purebred comparison



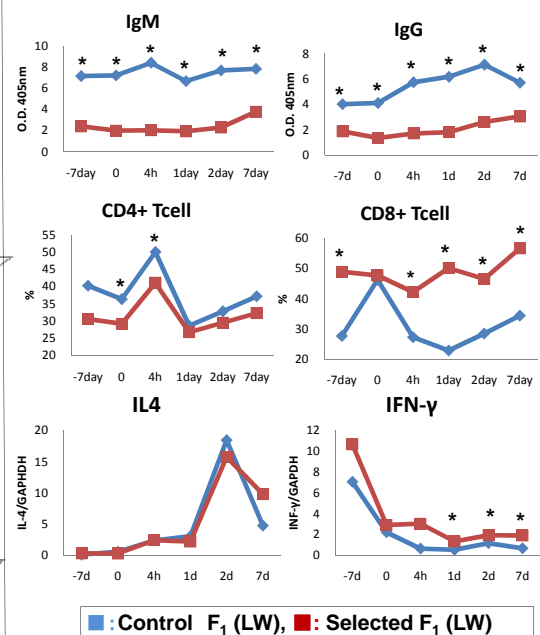
mRNA expression of Ileum Peyer's patch



mRNA expression of mesenteric lymph nodes



### Experiment 2. Crossbred comparison



## CONCLUSIONS

**Immunogenic property of two purebreds:** Landrace pigs have higher cellular immunity (IFN-γ, PA) and lower antibody-mediated immunity (CD4+Tcell, IL-4) than Large White pigs.

**Immunogenic property of crossbred:** Antibody-mediated immunity (IgM, IgG) was suppressed and that cellular immunity (CD8+Tcell, IFN-γ) became activated in anti-disease selected crossbred animals. Results also suggest that their immunogenic properties are influenced strongly by the immunogenic properties of Landrace pigs selected for MPS lesion.