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**Evaluation of *Saccharomyces cerevisiae* strain MIIP efficacy against influenza virus infections in murine and avian models**

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**Abstract:**

**Background/Objective:** Recent research highlights the potential of *S. cerevisiae* in combating respiratory diseases and bolstering immunity. This study aimed to evaluate the effectiveness of *S. cerevisiae* strain MIIP in treating H1N1 virus infection in C57BL/6 mice and avian influenza virus in laying hens.

**Methods:** In Trial 1, 7-week-old C57BL/6 mice were divided into an MIIP treatment group and a control group (n=15 per group). Mice were intranasally infected with PR8 H1N1 virus on Day 0, followed by MIIP treatment or glucose administration every 4 hours for three days. Serum samples were collected on Day 7 for IgA antibody detection and viral load assessment, while lung tissues were collected for histopathological examination and virus titer analysis. In Trial 2, laying hens housed in two units either received MIIP supplementation or served as controls. Serum samples were collected over three months for avian influenza virus antibody detection.

**Results:** In Trial 1, MIIP-treated mice exhibited significantly reduced viral titers in lung tissues (p<0.05) compared to controls. Histological examination showed reduced leukocyte infiltration in MIIP-treated mice lungs. Serum IgA antibody levels were significantly lower in the MIIP group (p<0.0001), correlating with reduced viral titers in serum. In Trial 2, MIIP supplementation led to a decline in avian influenza virus antibody levels over three months, with all treated hens becoming antibody-negative. Conversely, control hens maintained a high antibody-positive rate.

**Conclusion:** In conclusion, MIIP treatment effectively reduced viral load and mitigated pathological changes in murine models of influenza virus infection. Furthermore, MIIP supplementation in laying hens resulted in the clearance of avian influenza virus antibodies, suggesting a potential for enhancing immunity against respiratory pathogens. These findings underscore the therapeutic potential of MIIP as a live biotherapeutic product for respiratory diseases in various species, necessitating further research to elucidate underlying mechanisms and optimize therapeutic applications.

**Keywords:** influenza virus, Brewer’s yeast, laying hens, mice