



Immunological effects of Fortibac®

Fortibac® is a product based on the optimal combination of monoglycerides of selected fatty acids. Its effects are mainly targeted at the intestinal microbiome, gut epithelium and immune system.

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The immune system is a complex system of cells, tissues and organs with the main task to **protect organism against pathogens** and remove damaged and non-functional tissues. Together with the nervous and endocrine systems, the immune system maintains the integrity of the organism and its proper function is thus absolutely essential for the health and subsequent performance of the livestock.

The effect of **Fortibac®** on the immune system is complex and is manifested in particular in increased resistance to infectious and non-infectious diseases and anti-inflammatory activity. Product can therefore be described as **immunomodulatory preparation** – it stimulates immune system in case of infection, but decreases inadequate immune reactions so that the balance between anti-inflammatory and proinflammatory processes is rapidly restored.

The components of **Fortibac®** are considered to be mediators between the intestinal microbiome and the immune system. The molecular basis of this action is an agonistic effect on free fatty acid receptors and the inhibition of histone deacetylases. **It is worth emphasizing that the components of Fortibac® act not only in the intestine itself, but also indirectly affect immune and other functions throughout the body.**

The intestinal microbiome is sometimes referred to as a separate organ with essential functions on the health and performance of poultry. The components of **Fortibac®** have been demonstrated to increase the ratio of Firmicutes: Bacteroidetes in an *in vitro* study performed by the Veterinary Research Institute. An increase in this ratio translates into higher performance of animals. In addition, there has been observed an increase in the number of lactobacilli, typical beneficial bacteria responsible for the competitive exclusion of, for example, salmonella, and a decrease in the number of members of the Enterobacteriaceae family, which includes a long list of gram-negative pathogens. **Fortibac® has thus demonstrated the ability to favorably affect the intestinal microbiome of poultry.**



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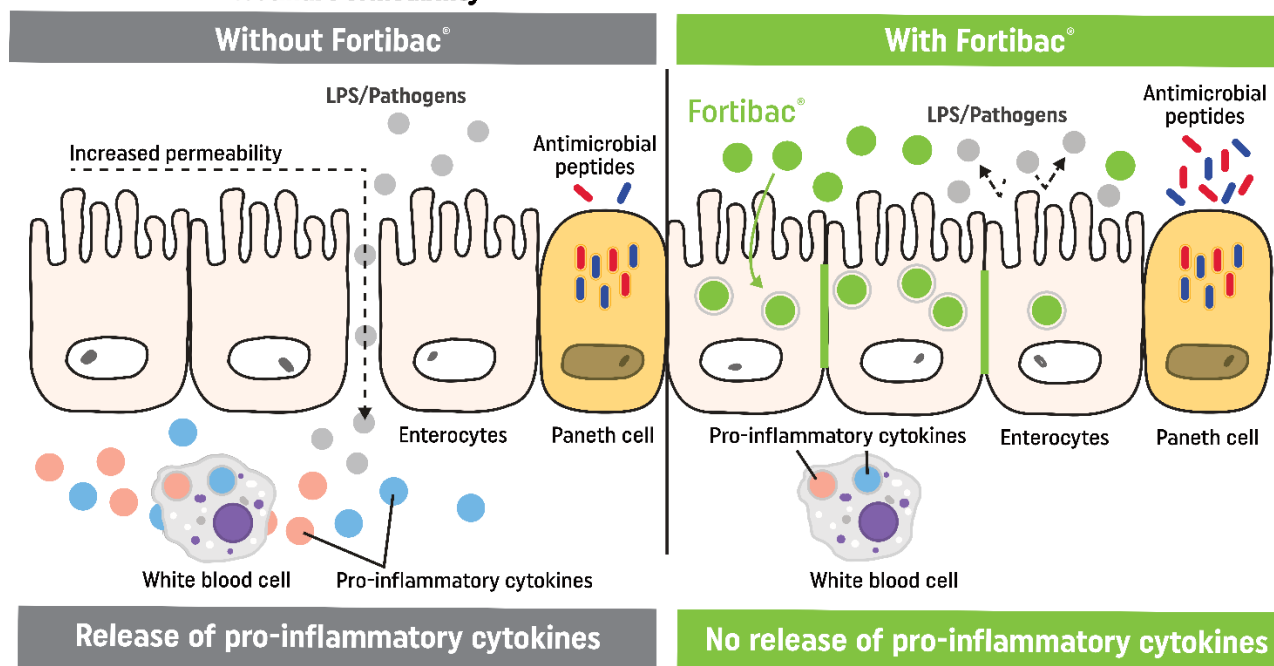
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Fortibac® supports the development of the intestinal mucosal immune system, which is the first line of defense against pathogens. It has a preventive and therapeutic effect in diseases like necrotic enteritis and coccidiosis in poultry. The components of **Fortibac®** have been shown to have a beneficial effect on the morphology of the lymphoid organs and the intestine in broilers.

Fortibac® reduces inadequate activation of the immune system, which occurs due to non-pathogenic bacteria and undigested or undesirable food components. This inadequate activation of the immune system has a pro-inflammatory effect and leads to significant energy losses. Its reduction thus improves overall health and increases growth and production efficiency. The components of **Fortibac®** reduced *in vitro* the overproduction of proinflammatory cytokines and restored immune homeostasis after exposure to Salmonella lipopolysaccharide cells.

At the same time, however, **Fortibac®** promotes the immune response to pathogens, both by mechanisms of non-specific immunity, e.g. by increasing the secretion of antimicrobial peptides, and by mechanisms of specific antibody response. This reduces the cost of medication and increases the effectiveness of vaccination. In broilers, **Fortibac®** components increased the expression of antimicrobial peptide genes in the gut and reduced the number of salmonella in the caecum more than tenfold after experimental infection with these bacteria.

Slide: Increased Intestinal Permeability



Release of pro-inflammatory cytokines

- Increased intestinal permeability
- Entry of lipopolysaccharides and pathogens in blood
- Release of pro-inflammatory cytokines
- No increase in production of antimicrobial peptides
- Negative energetic balance, decreased performance

No release of pro-inflammatory cytokines

- Increased intestinal integrity
- No entry of lipopolysaccharides and pathogens in blood
- No release of pro-inflammatory cytokines
- Increased production of antimicrobial peptides
- Positive energetic balance, increased performance

Bibliography is available from the author