

Utilising egg antibodies to help piglets achieve their full potential

by Dr Inge Heinzl, EW Nutrition GmbH, Trichterbecherweg 3, 49429, Visbek, Germany.

The importance of health status and how it affects successful pig production is well established and widely accepted as one of the most critical factors. To this end, it is important to emphasise that piglets with insufficient immunity cannot cope well under disease stress as they are more prone to pathogen infection, most likely causing diarrhoea.

It is not only that cost and mortality rate increase when pigs get sick, but also and perhaps most importantly, the full performance potential for growth cannot be achieved. To this effect, strengthening the immune system of newborn piglets with egg antibodies could just be that silver bullet!



Applying Pig Doser to a young piglet.

Immunity in young animals

Young mammalian animals are protected against diseases by specific antibodies. These are provided by their mother through colostrum (passive immunity) or they are produced by the animal after contact with a pathogen (active immunity).

Unlike humans, who receive maternal antibodies in the womb during pregnancy, sows possess a multilayered placenta that prohibits the transfer of antibodies to the foetus.

Thus, intake of antibodies from colostrum shortly after birth is essential. During the first 24 hours after birth, transfer of antibodies through the intestinal wall is highly effective.

Later on, not only the concentration of antibodies in the colostrum decreases drastically, but also the permeability of the intestinal mucosa reaches virtually zero levels.

Therefore, after receiving a small 'immu-

nity starter kit', the piglet must build up its own (active) immunity pretty quickly to survive (Fig. 1).

Potential problems

In Fig. 1 there is evidence of two areas with an immune deficit; the first shortly after birth and the second between four and five weeks. This is because passive immunity decreases faster than own (active) immunity increases.

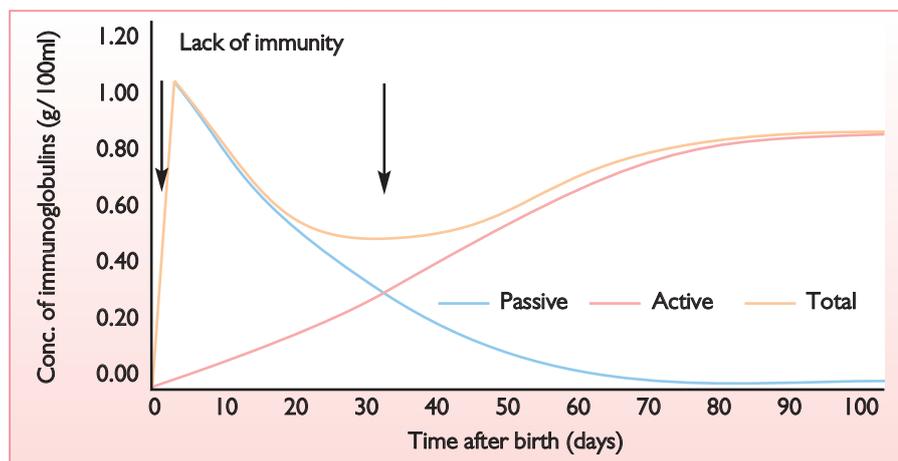
This temporarily occurring low state of immunity can even worsen if the intake of colostrum is insufficient or consumed by the piglet too late after birth (complications during parturition, big litter size, sow suffers from fever, etc).

Furthermore, there are sows which cannot provide enough quantity of colostrum or colostrum with a sufficient content of farm specific immunoglobulins (recently arrived sows with a very short time of adaptation).

If the piglets are now additionally challenged by other stress factors (change of feed, moving), then commonly occurring pathogens (Fig. 2) find ideal stress conditions to cause disease in the young animal.

The consequences are diarrhoea, prob-

Fig. 1. Development of immunity in young animals (Sieverding, 2000).



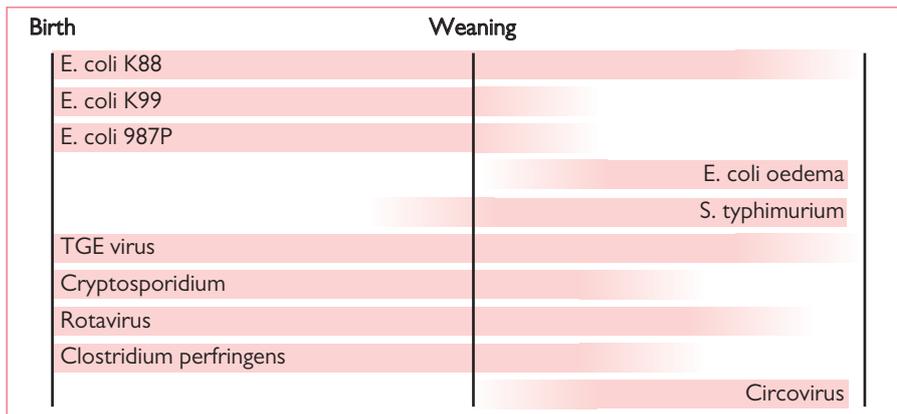


Fig. 2. Common pathogens causing diarrhoea in piglets before and after weaning.

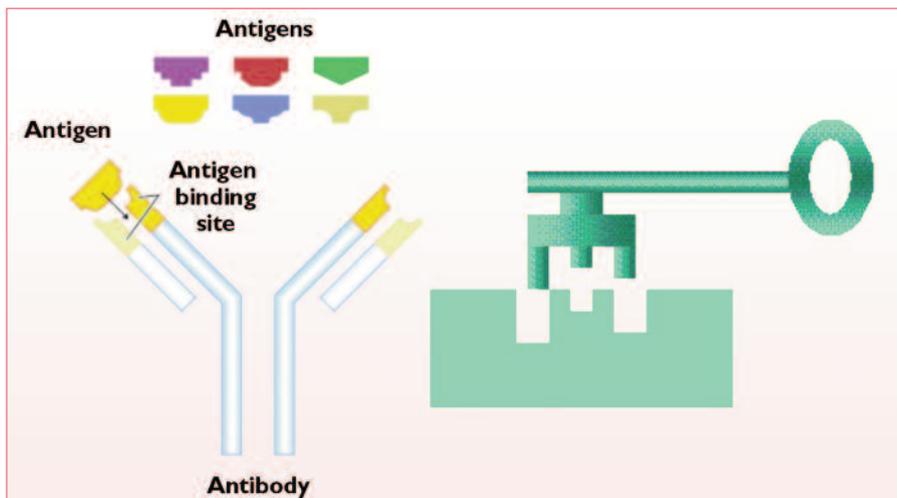


Fig. 3. Mode of action of the antibody; lock and key system.

Continued from page 7

lems with oedema, lower performance, and losses due to mortality.

A modern solution

In earlier times, many different types of farm animals were kept together and free range hens were in contact with virtually all the

pathogens on the farm. The hens did not necessarily show symptoms of the diseases, but produced antibodies against these pathogens.

Unlike mammals, hens only have a single chance to support their chicks immunologically during the first days of life, and that is the egg! Today, eggs bought from the supermarket for human consumption also contain antibodies against diseases that the hens

Fig. 4. Effects of egg powder with specific antibodies compared to egg powder of normal eggs and to a diet without any egg powder (control) on piglet diarrhoea (Kellner et al., 1994).

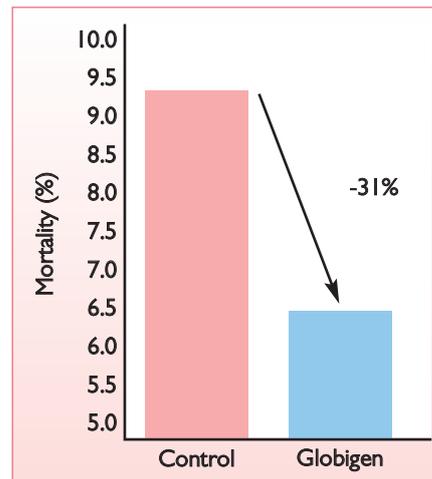
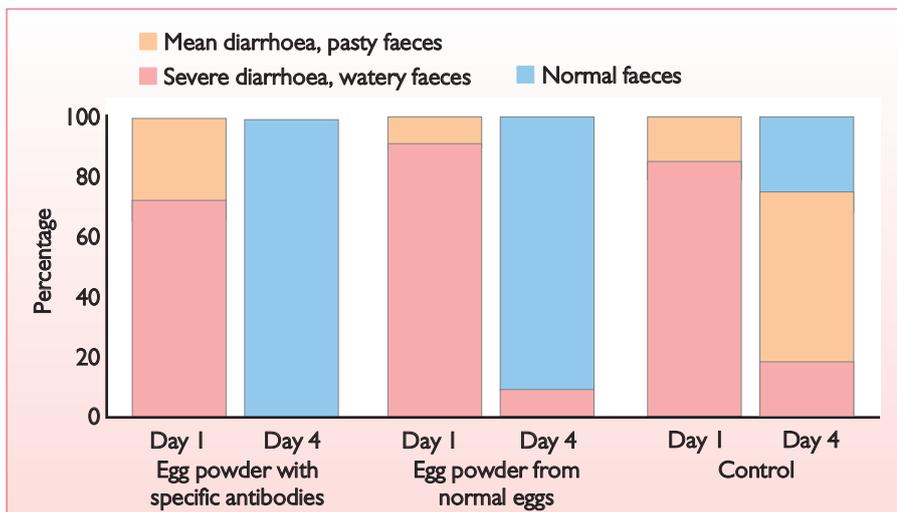


Fig. 5. Field trial with hyperimmunised egg powder (Globigen). Effect on mortality (Germany, 2007).

have been challenged with and, as such, this is completely natural!

In earlier times, farmers often used this natural phenomenon in practice by feeding eggs to ill and weak animals to strengthen their immunity system.

This traditional and well proved method is now being used in its modern form. Hens are hyper-vaccinated against pathogens that normally cause diarrhoea in piglets.

The hens do not get sick, but the eggs produced contain high levels of antibodies specific against these particular pathogens. The resulting egg powder is a highly potent feed supplement so that piglets can get additional and effective protection against diarrhoea during the first weeks of life.

Mode of action

First, we should briefly explain the mode of action of antibodies in general. As illustrated in Fig. 3, the antibody recognises the pathogen (antigen) because of its structure.

Most times, however, the whole structure is not necessary for recognition, as only parts can be sufficient (for example the villi of a virus). The effect, therefore, is very specific and is known as the lock and key system.

Egg antibodies (IgY) have a high binding capacity and they mainly act in the gut. They also identify the pathogen very specifically, in many cases from only parts of the structure.

In the case of E. coli, for example, the fimbrias that are responsible for binding to the intestinal cell wall are recognised and blocked. The resulting harmless antibody pathogen combination is then eliminated with the faeces.

Scientific background

A trial by Kellner et al. (1994) showed clearly the good effect of normal eggs and the even better effect of eggs from hens

Continued on page 11

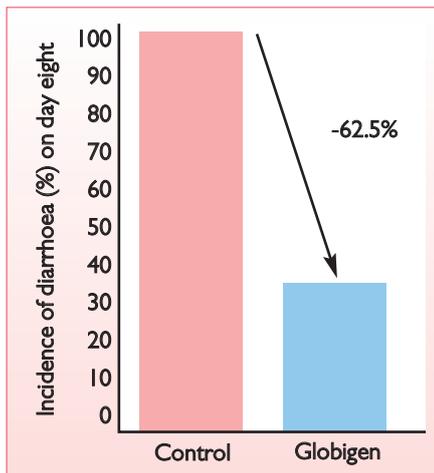


Fig. 6. Effect of hyperimmunised egg powder (Globigen) on diarrhoea. Field trial in Romania (2007).

Continued from page 9
hyperimmunised against relevant specific pathogens (Fig. 4). They demonstrated that even powder from normal eggs, which contains a lot of different but not necessarily relevant antibodies, could decrease the duration of diarrhoea.

On the first day (beginning of the trial) all animals suffered from diarrhoea. After the application of egg powder with specific antibodies, on day four, there was no more diarrhoea. In the group of pigs fed with normal eggs, 9% of the animals still suffered from diarrhoea on day four, the rest having been cured. In the control group (no egg antibodies) only 27% were free of diarrhoea, the rest still suffering from heavy (18%) or medium intensity (55%) diarrhoea.

Field trials – diarrhoea

Many other scientific and field studies have been conducted in different countries worldwide. All these trials show that the application of egg immunoglobulins strengthens the immunological system and, therefore, leads to lower rates of diarrhoea and mortality.

Here, some actual studies are shown representatively.

Fig. 5 shows a field trial conducted in Germany (2007) with 698 piglets. The test group was given 2ml of Globigen Pig Doser (containing egg immunoglobulins) during the first two days of life. This led to a decrease of mortality by 31%.

In another field trial, shown in Fig. 6, piglets already suffering from *E. coli* showed an enormous reduction of the incidence of diarrhoea by 62.5% due to the application of egg powder.

Even compared to commonly used medications, the application of egg immunoglobulins shows very good results. For example, In Vietnam (2007) piglets were treated against occurring diarrhoea with:

- Treatment 1: Coli 200 (containing colistin and trimethoprim) + *E. Lac* (probiotic).

- Treatment 2: Sulfachlozin + *E. Lac*.
- Treatment 3: Only Globigen Pig Doser.

The results are shown in Fig. 7.
Egg immunoglobulins caused a higher rate of cure (97.9%) than the normally used medications (85.5 and 86.8% respectively).

From this trial it is evident that egg antibodies could even be a very strong alternative to antibiotics.

Other applications

Egg immunoglobulins are very effective against oedema too. In a field trial in Bulgaria (2008) with 460 piglets, which all suffered from oedema, the test group receiving feed with egg antibodies showed nearly 10% higher daily gain than the control group. Mortality was halved and treatment costs decreased by 39%.

There also exists new technical expertise on the use of egg antibodies on growth improvement in healthy animals.

For example in a field trial conducted in Osnabrück, Germany (2004), with 211 animals, the test group averaged 23% higher daily gain, (Fig. 8).

In this trial the dosage was 2kg Globigen Jump Start per tonne of feed before weaning and 1kg after weaning. Feed conversion also improved by more than 16%.

Conclusions

Due to the application of egg antibodies, piglets can start in a good immunological

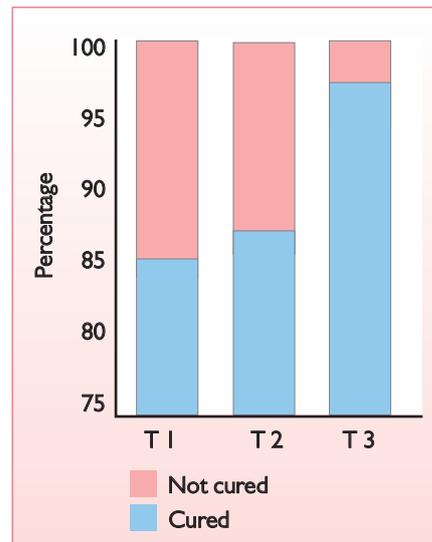


Fig. 7. Effect of egg immunoglobulins (Globigen Pig Doser) against common antibiotics in curing pre-weaning diarrhoea (Vietnam, 2007).

condition shortly after birth and, therefore, obtain good resistance against the commonly occurring diseases.

This will lead to a decrease in diarrhoea, costs for medical treatment and also mortality rates. At the end, a healthier piglet will always have the potential to perform to its full capacity resulting in higher output, lower costs and, therefore, higher profit. ■

References are available from the author upon request

Fig. 8. Use of egg powder (Globigen) in healthy animals improves growth performance (Germany, 2008).

