

Pighealth BYTES

Number: 166 Vaccinology II

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Vaccine development

Vaccine strain selection is an extremely important step in vaccine development but other factors are also important. The first question is whether to choose a (modified-)live vaccine, an inactivated or killed vaccine or going for a sub-unit or even for a vectored vaccine. Live vaccines are preferred because they induce immunity that best resembles a natural infection, but live vaccines are also famous for causing problems.

When using a live vaccine a new strain that was not present on the farm before is introduced with the vaccination. This can create problems, as can be seen with the last reported case from Denmark involving two live viral vaccine strains. These incidences seldomly occur but variation is the rule in biology and variation does not know a limit. Thus, inactivated vaccines are preferred from a safety standpoint but their efficacy might need attention.

When subunits, specific part of the bacteria (like in the case of *Actinobacillus pleuropneumoniae*) or virus (like in the case of PCV2 virus), can be identified that induce the desired level of protection, then the whole process becomes easier. Now it is more a matter of quantity (amount) of the sub-unit and selecting the right adjuvant (chemical compound added to the formulation that helps in building up the immune response) and the right vaccination scheme.

Vectored vaccines are a completely different class of vaccines. They have been introduced for poultry but not yet in the field of vaccines for swine.

Conclusion

In vaccine development both the efficacy and safety profile needs specific and detailed attention. The general rule for vaccines is that there is a balance between efficacy and safety. The higher the efficacy the more chances there are to observe side effects. Live vaccines can cause problems through introducing new strains onto a farm.

Animal-friendly adjuvanted sub-unit vaccines are among the best products that research has brought to the market but in certain cases live vaccines are still needed.