

## **Present and future of IgY-Technology**

P.A. Chacana

Instituto de Virología, CICVyA, Instituto Nacional de Tecnología Agropecuaria, Castelar, Argentina

pachacana@balcarce.inta.gov.ar

Egg yolk immunoglobulins (IgY) are an interesting alternative to the use of mammal antibodies. In 1893, the German researcher Klemperer demonstrated that egg yolk extracts obtained from hens hyperimmunized with the tetanic toxin, protected mice challenged with lethal doses of the toxin. Only during last decades, IgY Technology was considered important and nowadays many papers are increasingly been published, describing IgY characteristics and applications in different scientific fields.

At present, many information about the characteristics of the immunoglobulin is available. Structurally, the IgY molecule is composed by two light and two heavy chains and is actively transferred from blood to yolk by means of specific receptors. In general, IgM and IgA predominate in egg white whereas IgY predominates in the yolk at a variable concentration, ranging between 10 and 20 mg/mL. In comparison to mammal IgG, avian IgY has many advantages, among them: it is very economical because it can be produced in large quantities, bleeding is avoided, it does not show interference with rheumatoid factors, and it does not activate the mammal complement system. Many studies demonstrated that affinity and sensibility of IgY antibodies are similar to mammal IgG. In addition, due to the phylogenetic distance between mammals and birds, IgY is able to recognize highly conserved mammal proteins that otherwise would be undetectable if rabbit antibodies were used. There are also many different methods for IgY extraction and purification from egg yolk.

One of the most important fields of application of IgY is immunoprophylaxis and immunotherapy of diseases. Many studies have been done showing the feasibility of these applications as, for instance, prophylaxis and treatment of human and animal diarrheas, dental caries, xenotransplantations, uremic hemolytic syndrome, cystic fibrosis, antivenoms and antitoxins, and even in infectious diseases of fish.

There is no doubt that IgY-Technology has been successfully developed during the last years. Once widely accepted by the scientific community, the future challenge of this egg-based biotechnology is to offer real alternatives and solutions for the society.