chicken produces its own antibodies following exposure to a foreign material, the process is called active immunity. This occurs after the bird is exposed to a vaccine or a disease. Active immunity is harmed by anything that damages the cellular or humoral immune systems.

When the chick receives pre-made antibodies from the hen through the egg, this is termed passive immunity. These antibodies are not produced by the chick. Maternal antibodies are present in the yolk, albumin, and fluids of the egg. If the hen has a high antibody titer level to a disease, the chick should also be immune for several weeks. However, since the immune system of the chick is not stimulated, there will be no antibodies produced by the chick and no memory cells.

The flock manager must be aware of the maternal antibody levels in the chicks to schedule vaccinations. If chickens are vaccinated when maternal antibody titer levels are elevated, the vaccine may be buffered excessively, resulting in a reduced response. Conversely, if vaccinations are delayed and maternal titer levels are low, a severe vaccine reaction may result. Chickens may also be susceptible to diseases as maternal titer levels will be low, and approximately 12 days is required following vaccination before minimal protective antibody levels are produced.

In summary, the immune system of the chicken is very helpful in preventing disease and helping to ensure that maximum productive potential is realized. We must learn how to take advantage of all parts of the system when designing health programs.

Routinely, serum samples are submitted to a poultry diagnostic laboratory to determine antibody titer levels as an aid in the diagnosis of disease or as part of a routine monitoring program. However, it is important to keep in mind that the ELISA serologic test system commonly used measures only Ig G levels in the blood. No determination is made of Ig A (local protection), Ig M (early protection), cell-mediated immunity, or the non-specific immune system. Although serology can be very useful in a poultry health program, it is important to understand its limitations. Table 2 lists common poultry diseases and the part of the immune system considered to be the primary protective mechanism in controlling the disease organism.

ELISA serology, commonly used in the poultry industry, has limitations. Some of these include the following.

- Measures Ig G response only, not Ig A, Ig M, CMI, or the non-specific immune mechanisms.
- Must have paired sera to make determinations (diagnostic).
- Must have an organized bleeding schedule (monitoring).
- Antigenic specificity may lead to inaccurate results.
- Serum samples must be properly selected (randomly, sufficient number).
- Selection of birds is critical (representative of the disease problem - diagnostic; or of the flock - monitoring). Lack of consistency of results between laboratories.

The development of an infectious disease depends on three variables: 1) resistance of the chicken, 2) virulence of the disease organism, and 3) dosage of the organism to which birds are exposed. Through effective biosecurity practices, the dosage of the disease organism is reduced or even eliminated; and through proper vaccination practices, the resistance of the bird can be increased. The only factor over which there is little control is the virulence of the disease organism in the field.

Primary Protective Mechanism/Disease

	Ig A	Ig	CMI
Inf. Bursal Dis.		x	
Newcastle Dis.	x	x	
Inf. Bronchitis	x		
Marek's Dis.			x
Fowl Pox			x
Coccidia			x

Table 2. Common poultry diseases and that part of the immune system mechanism that primarily controls the organism.