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Deficiency diseases are just what they say they are – they are diseases caused by a shortage of something, usually a key nutrient, in the animals' diet. An interesting example of this is zinc deficiency which occurred with the change over from metal or galvanised pipes to plastic ones. This was soon corrected by supplementing the feed with minute amounts of zinc.

## Types of deficiency

Absolute deficiencies occur when the animal is just not receiving the amount of the nutrient, such as a mineral, that it requires. The clinical picture is often dose dependent and this is reflected in the severity of the clinical signs.

Relative deficiencies occur when the availability of one nutrient influences the amount required of a second. This is sometimes seen with calcium and phosphorus.

Sometimes the amount of a nutrient that is in the diet is significantly greater than that available to the animal. A good example of this is phosphorus – much of the phosphorus in many plant sources is bound up in a form known as phytate phosphorus, which is unavailable to the animal. Nowadays, this scenario is usually addressed by the inclusion of an enzyme known as phytase in the diet which breaks down the plant phytate, thereby releasing the phosphorus and making it available to the animal.

Sometimes anti-nutritive factors come into play. Deficiencies are more likely to be seen in high performing animals whose requirements for micro-nutrients can be greater.

## Diagnosis of vitamin deficiencies

Diagnosis is initially by history, clinical signs and post mortem findings and these can be confirmed by chemical analysis of tissues or blood and of the feed that has been consumed. Final confirmation is often by seeing a return to normal health when the deficient nutrient is given to the affected animals.

## The current situation

True deficiencies are not so common now as the nutrient requirements of (high performing) animals are better understood and more than catered for in dietary formulations. However, deficiency syndromes are still seen when there is a disease, usually an enteric problem, that interferes with key nutrient uptake. A good example of this is rickets in meat poultry following coccidiosis. But even this is relatively rare today as many diets contain overages of key micronutrients to allow for such scenarios.

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