

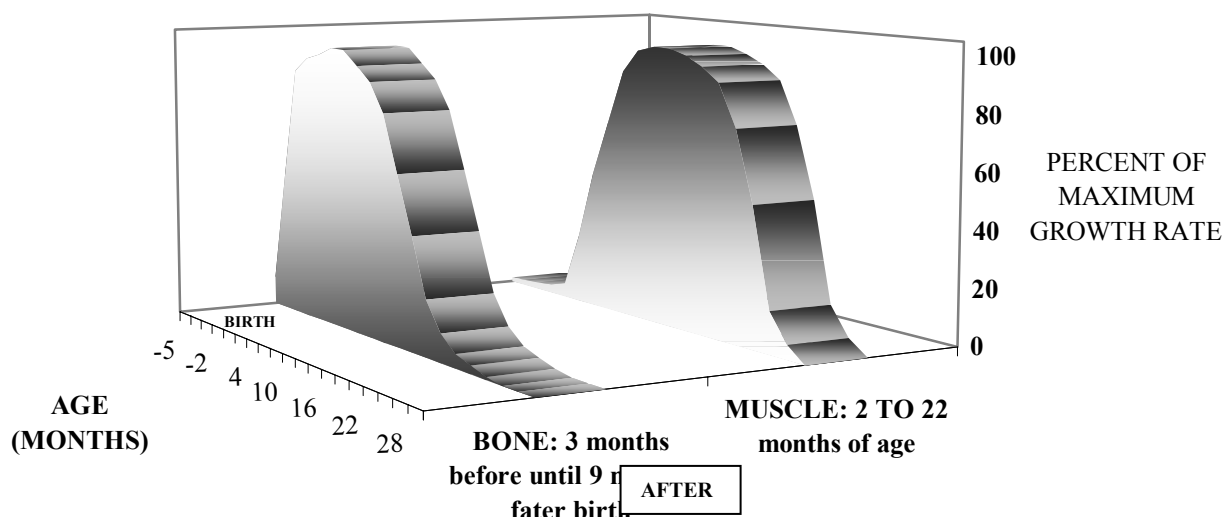
**PREPARING FOR THE YEARLING SALES – WHEN TO BEGIN?©**  
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Given that most yearlings are 16 to 18 months old at sale time, when should 'yearling prep' begin?

Since 'bone', 'muscling' and 'clean' X-rays are critical for sales success, it is prudent to examine the time frames in which these structures are inherently programmed to reach genetic potential and the risk periods during which complications may occur.

As shown in the chart below, the period of maximum bone growth in terms of achieving genetic potential, is from 3 months before birth until around 12 months after birth; for muscle it is from 2 to 22 months of age.

**MAJOR GROWTH PERIODS FOR BONE AND MUSCLE**



The racing industry is plagued by a high incidence of bone and joint problems. The serendipitous nature of these disorders necessitates that close attention be paid to factors that increase the risk of developing such conditions. So whilst considering the windows of opportunity for achieving genetic potential in terms of growth, stud managers must simultaneously be aware of the major risk periods for OCD and other developmental bone diseases.

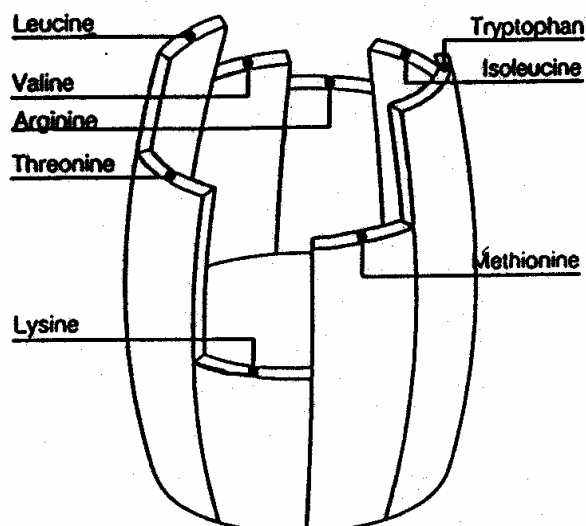
The major risk period for development of hock OCD is from 2 months before until 3 months after birth; for stifle OCD, from 5 to 8 months of age. Without

compromising growth in terms of height, a lighter condition is preferable at this age. Muscle development will not ultimately be affected because muscle fibre size increases by up to 70% between 7 and 18 months of age and growth continues well into the second year of life. Muscle growth in terms of size and number of fibres continues until 2 years of age. It is wise to protect bone and joint development during the first 12 months by controlling body condition and understanding that muscle development will not be affected as it continues well beyond the yearling stage.

Included in the presentation of the yearling, is a clean set of Xrays. Because joint and bone problems begin to develop even before birth, sales preparation must begin at the same time. Overnutrition, excess energy and mineral imbalances should be avoided and growth monitored. However, because we must be primarily concerned with bone during the first 12 months of life, tracking body weight has limited usefulness as it gives no indication of body composition or bone development. For example, 2 weanlings may have a similar average daily gain, but one may be building muscle and bone and the other laying down fat or 'cover'.

Whether a growing horse builds bone and lean muscle mass or lays down fat is determined in the first instance by the quality and quantity of protein in the diet - energy, vitamins and minerals play supporting roles. The quality of any protein in the diet is determined by the number and amount of essential amino acids it contains. It is critical that the diet contains all essential amino acids in a form that is readily digested by the small intestine. Whilst there is widespread understanding of the pivotal role of lysine, there are 9 other essential amino acids and a deficiency of any one of these will impact on body composition and the power-to-weight ratio.

Picture a wooden water barrel. The barrel can only hold water to the level of the shortest slat. Similarly, if each wooden slat represents an essential amino acid, a deficiency of any one, will place a limit on bone and muscle building. The other essential amino acids cannot be used and are converted to energy, increasing energy levels and stored as fat. When this occurs, the young horse will lay down 'cover' (fat) instead of building muscle, blood and bone.



Amino acid utilization also depends on digestibility. It doesn't matter how good the protein looks on paper if the amino acids don't make their way into the body efficiently. Digestibility of vegetable proteins varies between 59 and 80%, depending on how carefully they are processed. Steam-extrusion increases digestibility by up to 40%. Overheating is damaging to many amino acids and dry-extrusion results in loss of vitamins and destruction of proteins due to friction and shear in the extruder barrel. Studies in Switzerland have shown up to 50% lysine damage when dry extrusion is used. Losses during steam-extrusion are negligible (around 5%).

Analysis of the diets of growing horses that are laying down too much cover - instead of gaining in height and muscle development – invariably show amino acid deficiencies. Although weight and height measure growth, they are not sensitive enough to reveal the effects of lowered amino acid absorption on skeletal or muscle development.

The elimination of subclinical disease in the young horse is an advantage for future racing career and the future racing career must be part of the goal in yearling sales prep as it ultimately affects the reputation of the stallion, the mare, the stud and through this, the results at future sales. Improper bone and cartilage formation may occur in animals fed high grain diets to promote rapid growth and development. Absorption of large amounts of raw grain carbohydrate affects hormones that control behaviour and bone and cartilage development. In addition, grain fermentation causes acid build-up, which lowers skeletal mineral retention. The racing industry is plagued by a high incidence of bone and skeletal disorders, which can cause temporary or permanent lameness. The potential to develop chronic and debilitating bone diseases occurs early in life, making correct nutrition of the foal and weanling as important as the yearling prep for achieving sales success. If success at the sales is the focus of yearling prep, an understanding of the time line for achieving genetic potential in terms of muscle, bone; a respect for the periods of major risk for abnormalities and an acknowledgement that success at the track will affect future sales results are fundamental to sustained sales success.

A balancing act between economics, management and nutritional requirements occurs between weaning and 18 months of age. Owners and trainers want well-muscled, well-grown sales yearlings and avoid those that are overfat. But how a yearling is managed for sales presentation bears little relationship to how it was managed during the critical foal and weanling stages – the time when yearling sales prep must begin. Fundamental to the formulation and processing of MITAVITE BREEDA and PROMITA is an understanding of the requirements, risks and growth patterns of the foal and weanling.

To create a winning horse and allow it to achieve genetic potential, requires a recognition of the limits of the animal's physical capabilities and an understanding of bone and muscle growth. While bone development must be nurtured and protected during the first 12 months, muscle growth dominates in the yearling. Muscle fibre mass affects maximal force output and failure to meet growth potential at the yearling stage can reduce ultimate stride length and acceleration. Recognising the nutritional demands on the yearling and the multiple demands on those involved in yearling management, MITAVITE YEARLING PREP has

been formulated to support continued muscle development as well as produce a quality sales finish. The skill of the person feeding the horse and knowledge of the individuality of horses are essential to good management and will never be replaced, but as in any business, it is important to have a team of advisers.