



به نام نامی دادار یکتا  
خداوند بزرگ بی نیازی

ز صنع او نشان باشد به هرجا  
محبت، همدلی، بنده نوازی



# Fat Soluble Vitamins in Broiler Breeders Diet

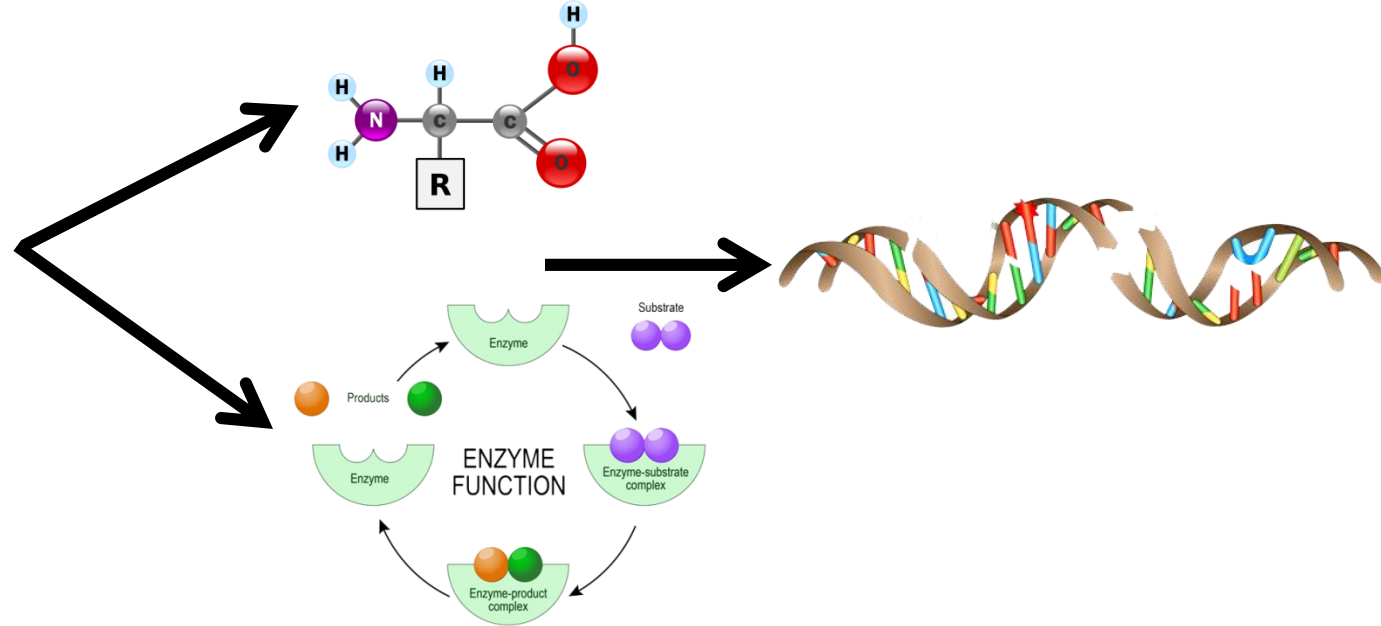
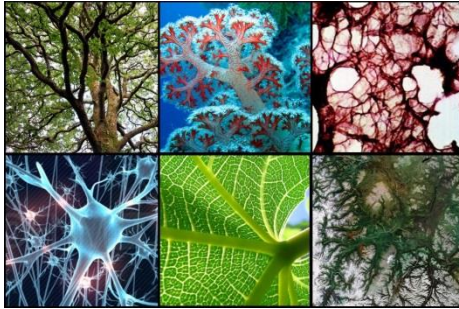
ارائه دهنده: لیلا لطفی

Presenter: Leila Lotfi

The Ohio State University Postdoc Researcher

Free radicals + (PUFAs) →

Lipid Peroxidation



Rancid Flavours

Changes in Nutritional Value

Formation of Toxic Products (Mainly Aldehydes)

Embryonic tissues are characterised by high concentration of PUFAs

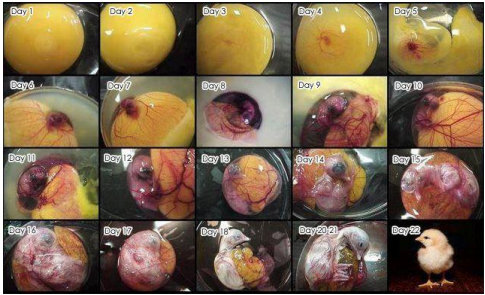
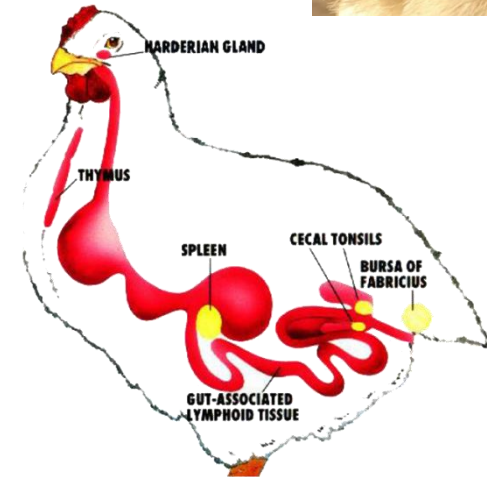
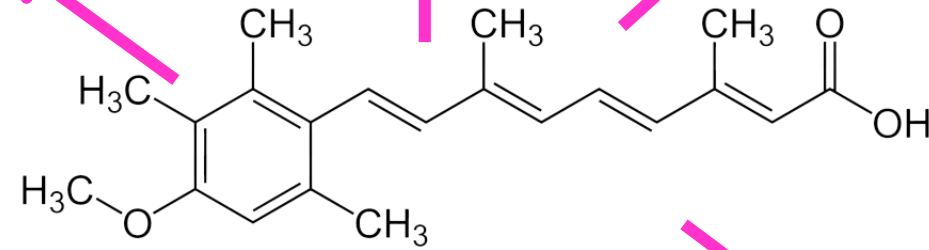
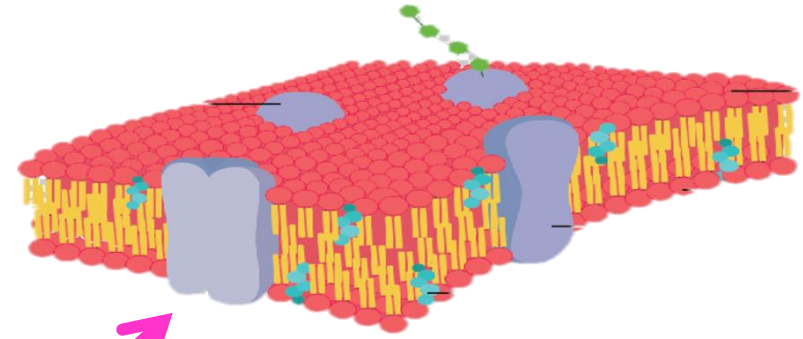
Vitamins

Minerals

Improve the Oxidative Protection of



# Vitamin A



# Vitamin A

The National Research Council	→	3,000 IU/kg
Max Tolerable for Laying period IU/kg	→	40,000
Broiler Breeder Companies	→	10,000 IU/kg
Broiler Breeder Commercial Feed	→	10,000–15,000 IU/kg

Vitamin A is easily destroyed in feed processing and storage

The Effect of Higher levels of Vitamin A  
(210,000 to 410,000 IU/kg)

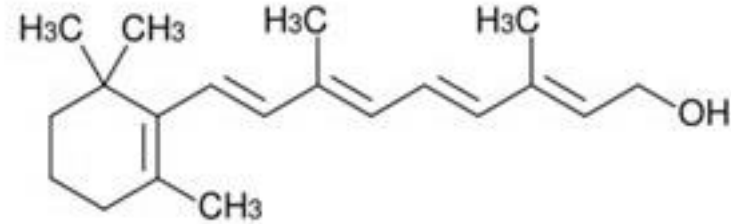
{

- Egg production
- Egg size
- Hatchability

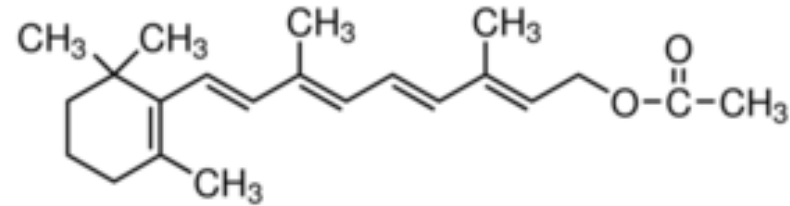


**1 IU of vitamin A activity ~**

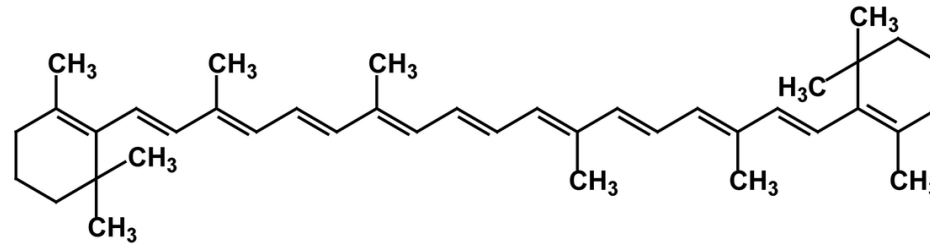
0.3 mcg of pure retinol



0.344 mcg of retinyl acetate

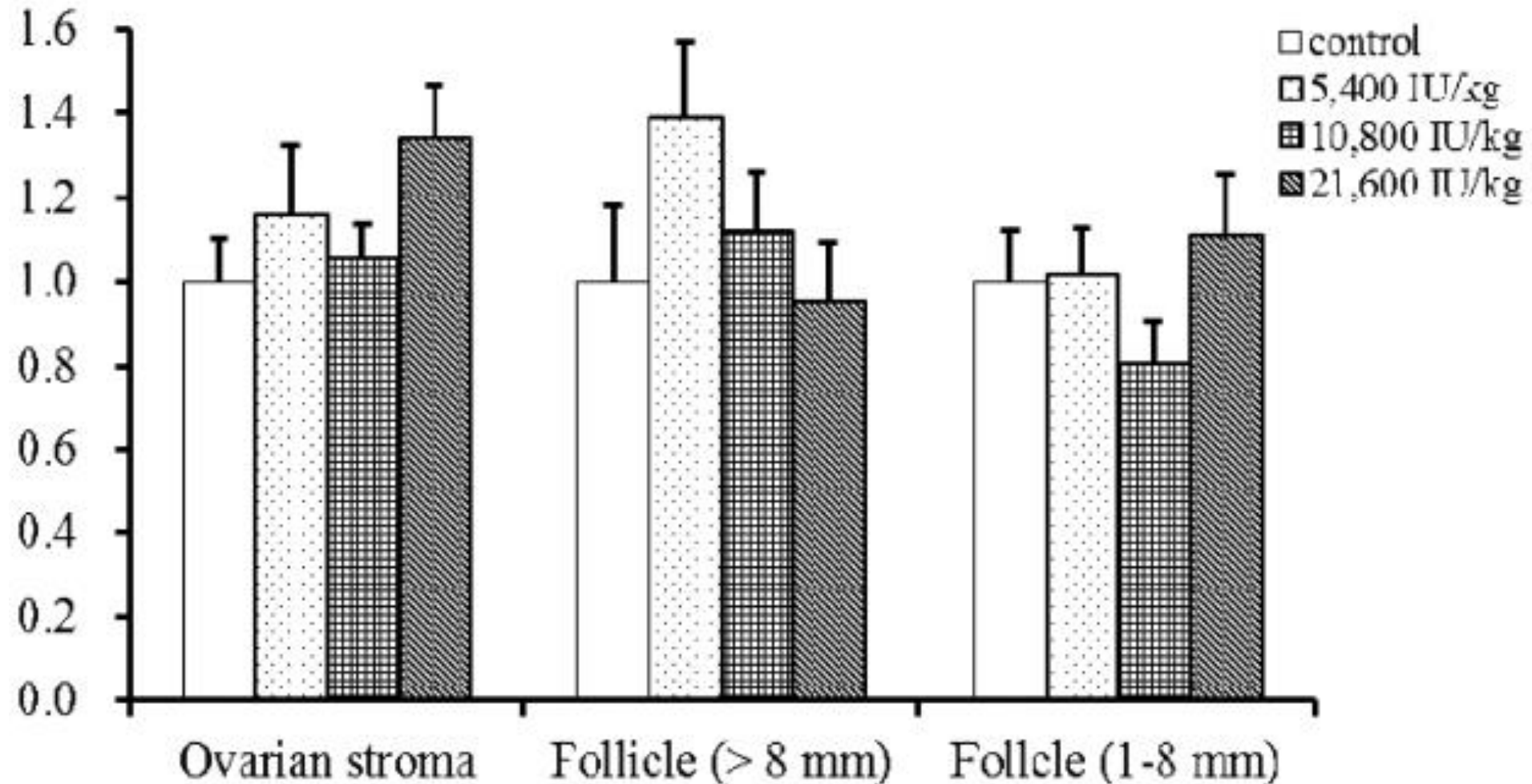


0.6 mcg of  $\beta$ -carotene



young chicks use  $\beta$ -carotene less efficiently

**Dietary vitamin A supplementation improved reproductive performance by regulating ovarian expression of hormone receptors in broiler breeders**





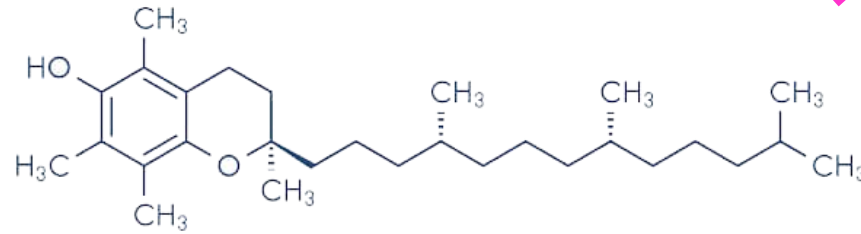
# Vitamin E

Gonadal Function

Regulation of Heme Biosynthesis  
(Iron Metabolism)

Fertility &  
Chick Quality

Antioxidant

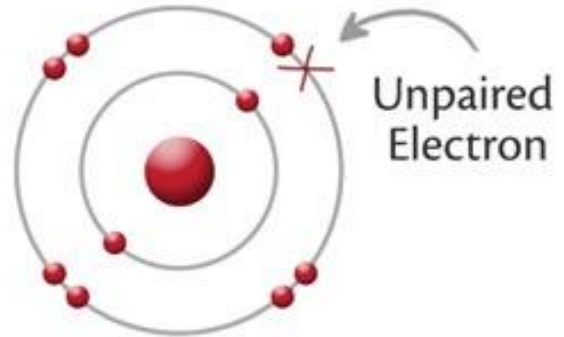


alpha-tocopherol

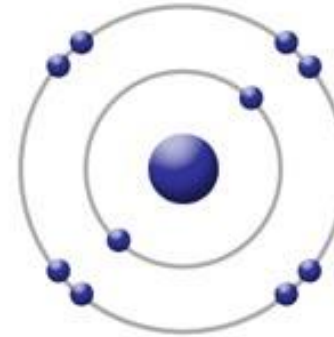
Redistribution of Cholesterol among  
the Lipoproteins

Intestinal Amino Acids Transport

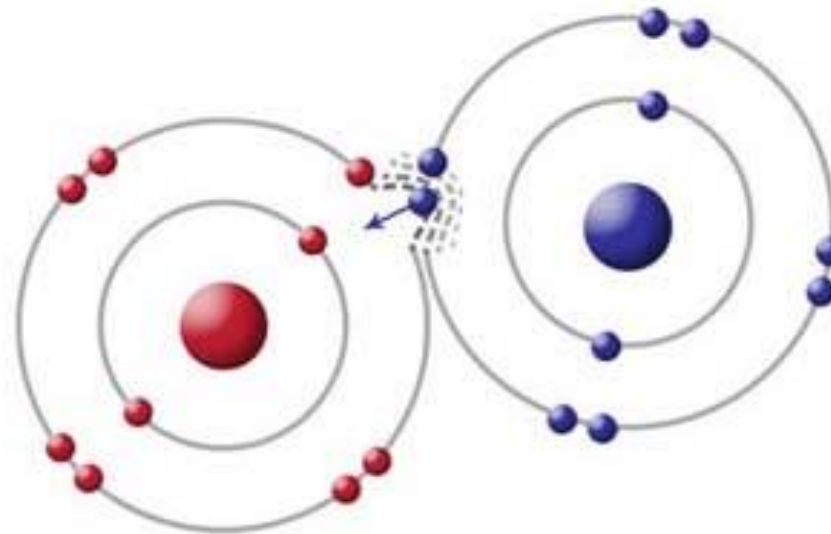
Free Radical



Healthy Stable Atom



**Oxidative stress**



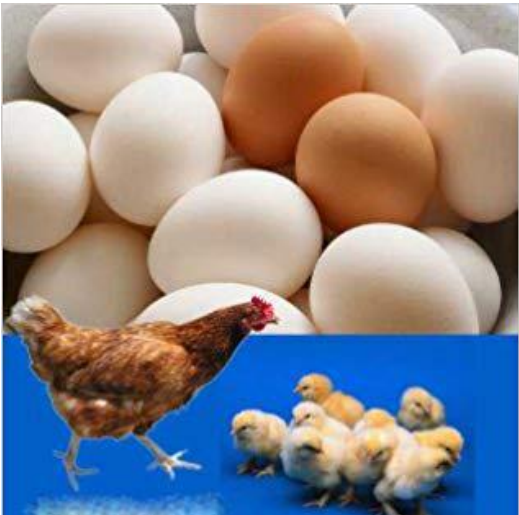
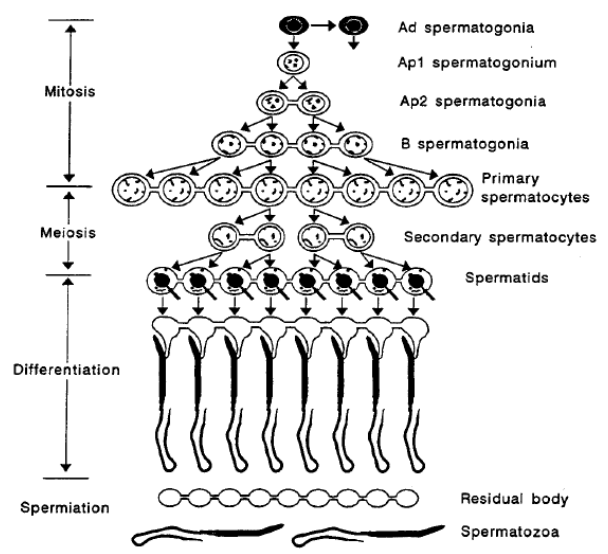
**Environmental Temperature Extremes**

**Environmental pH & Light**

**Health Challenges**

**Low Nutritional Quality Diets**

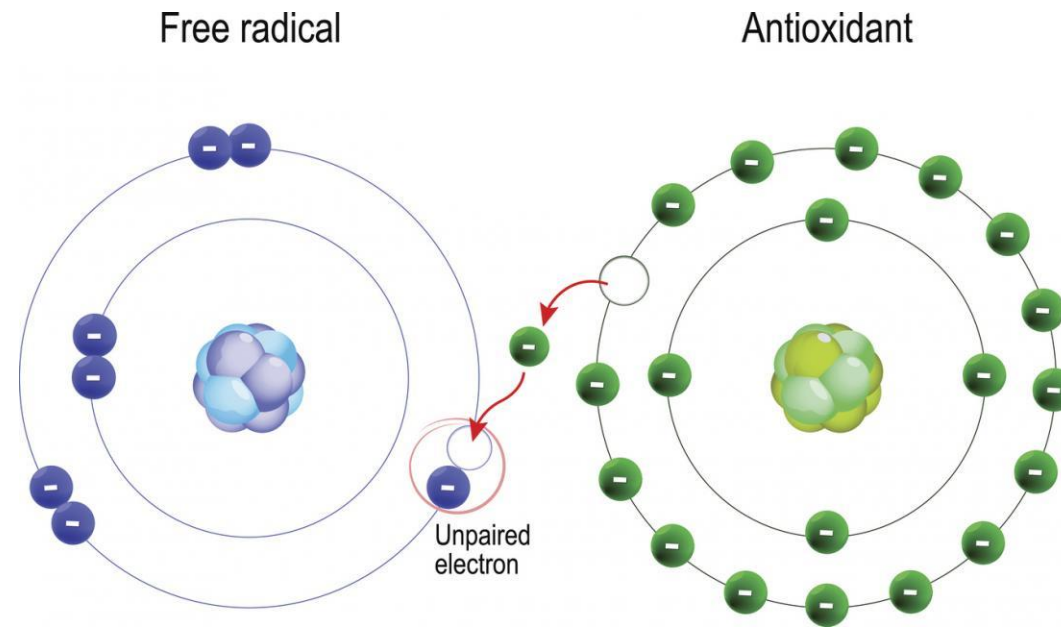
# Oxidative stress

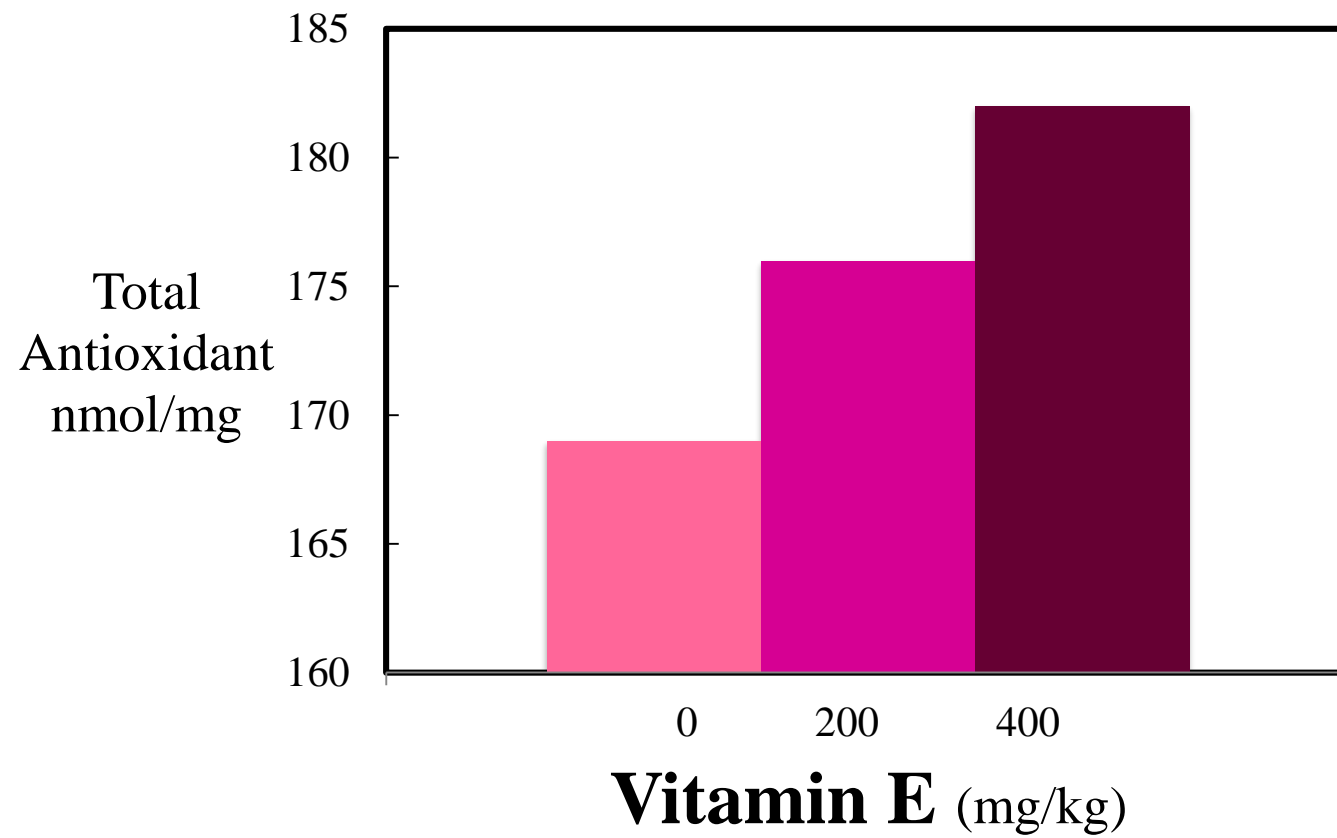


## Enzymatic Defense System

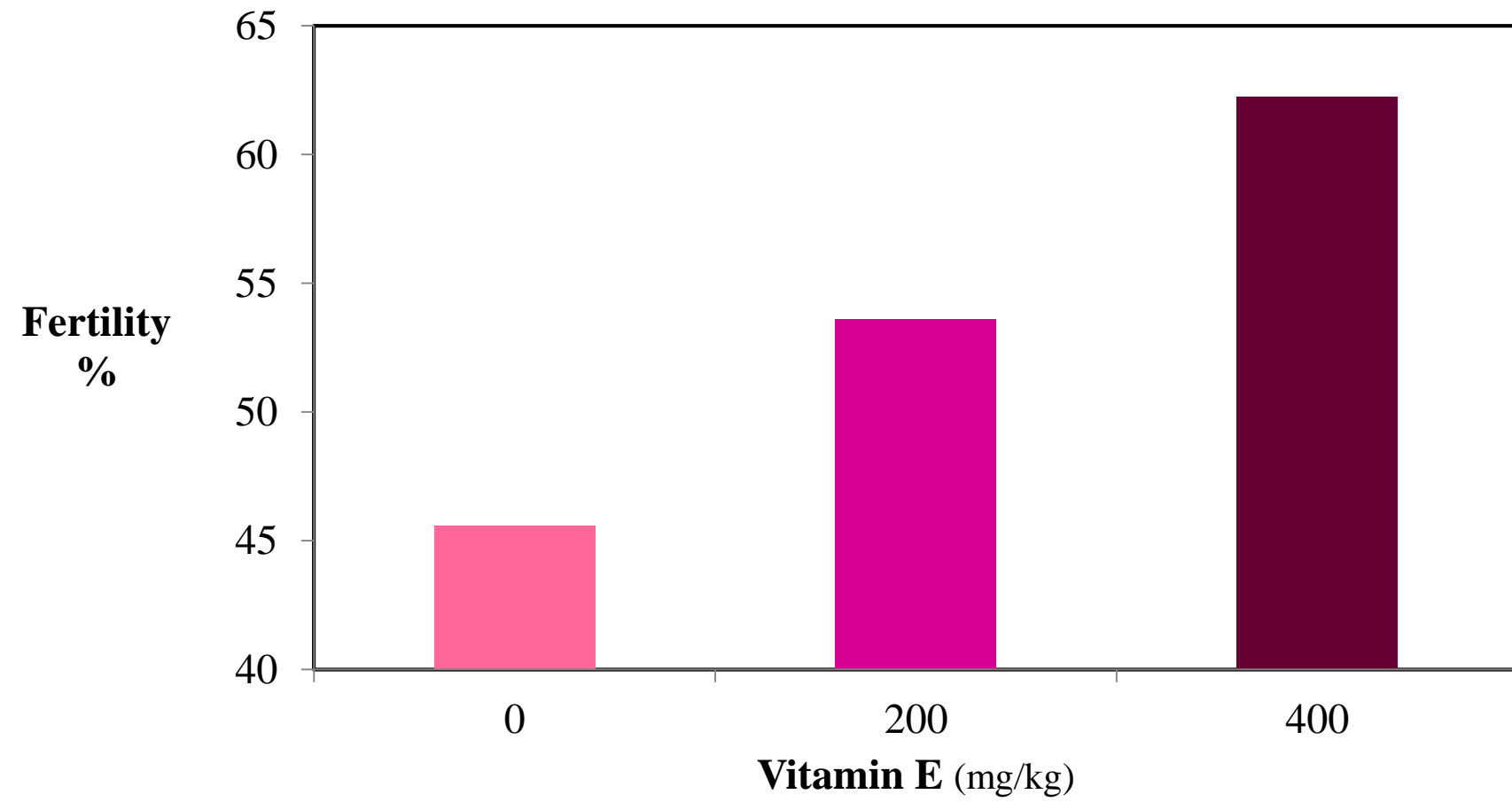
- Glutathione Peroxidase
- Catalase
- Superoxide Dismutase

+ Reduction Agents

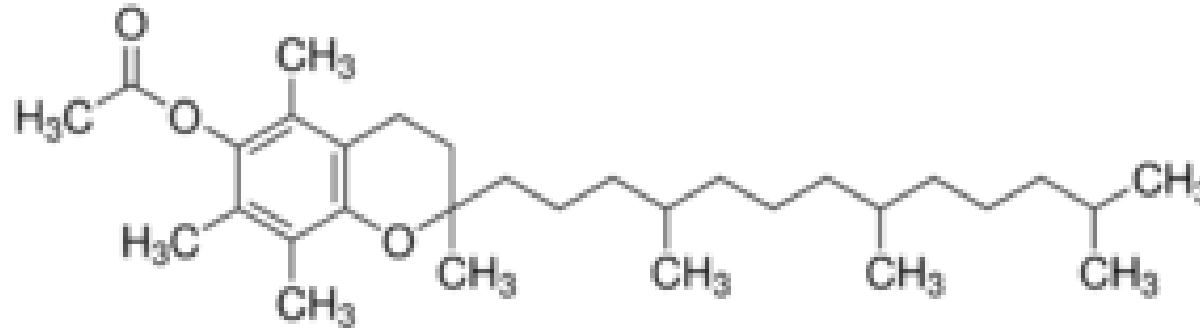








One IU of vitamin E is equivalent to 1 mg of synthetic dl- $\alpha$ -tocopherol acetate



**Vitamin E requirements vary**

Type and level of fat in the diet

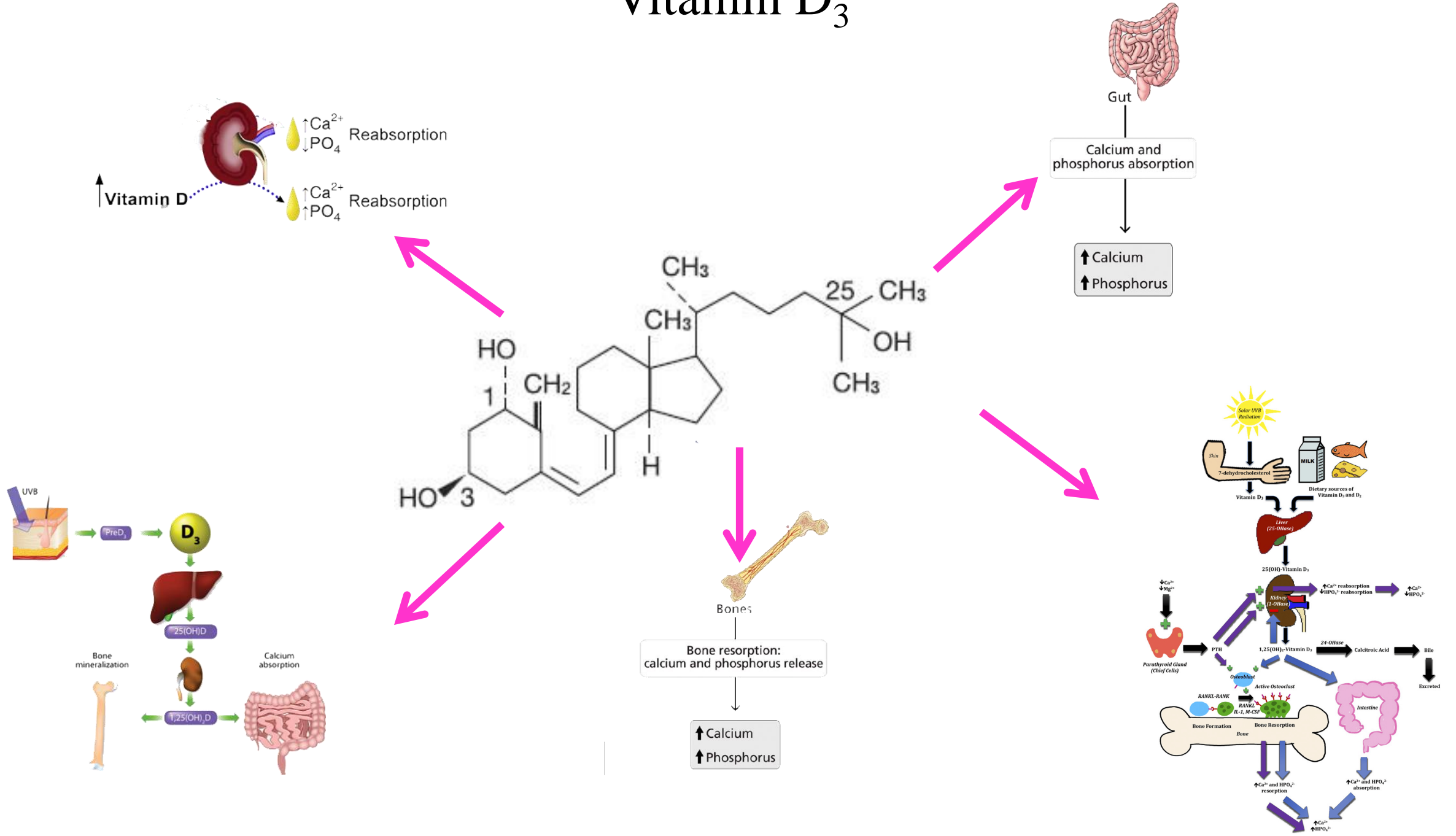
The levels of selenium and trace minerals

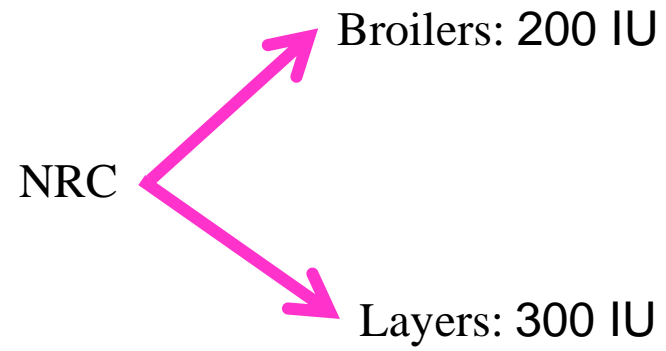
The presence or absence of other antioxidants

## Tip

When diets high in long-chain highly polyunsaturated fatty acids are fed, vitamin E levels should be increased considerably

# Vitamin D<sub>3</sub>



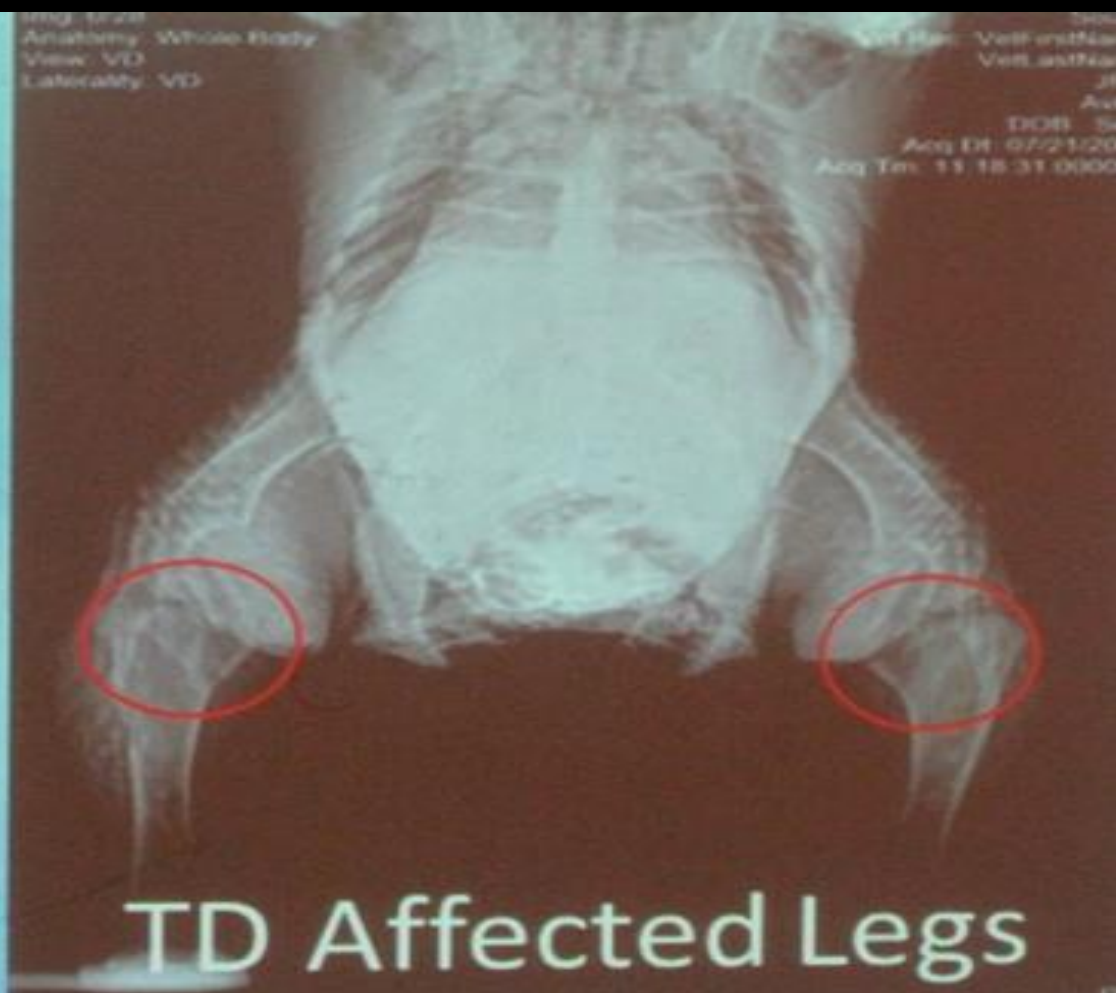


4,000 IU/kg in the diets of broiler chicks

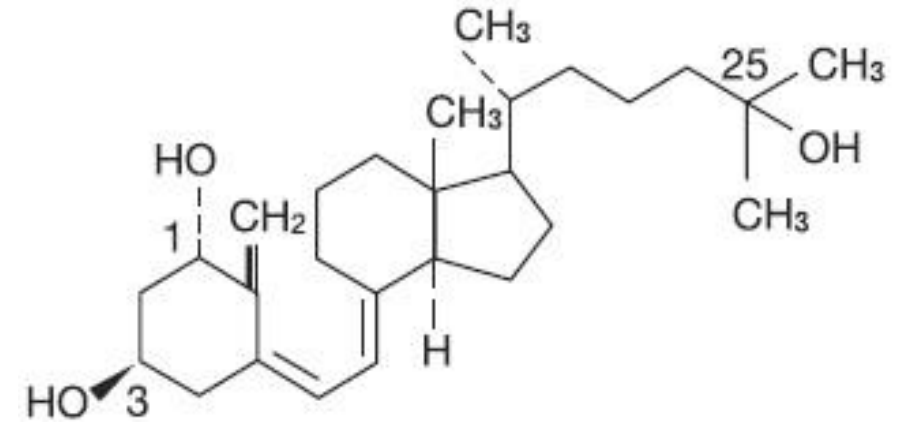


10,000 IU of vitamin D<sub>3</sub>/kg of diet



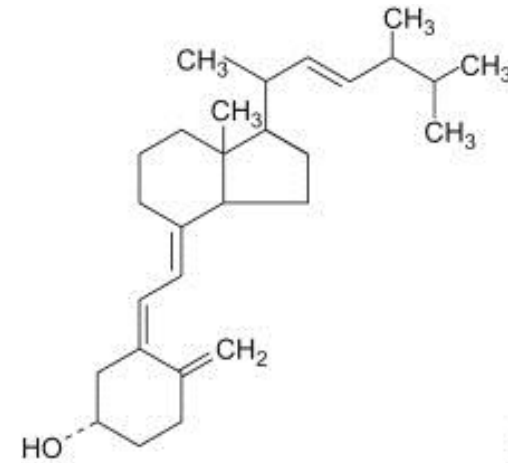


One IU of vitamin D is equal to 0.025 mcg of cholecalciferol

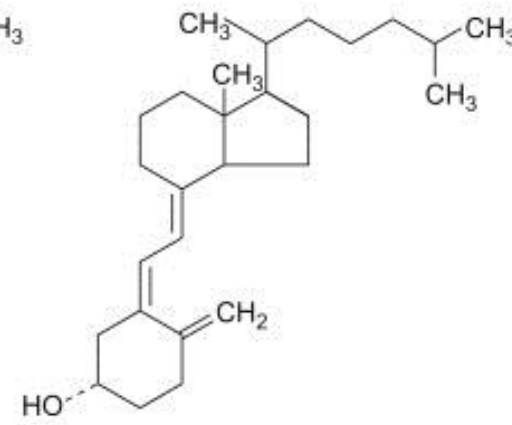


Ergocalciferol (vitamin D<sub>2</sub>)

used with an efficiency of <10% of vitamin D<sub>3</sub> in poultry



Ergocalciferol



Cholecalciferol



# Quantitative Requirements for Vitamin D<sub>3</sub>

Maximum Performance

Maximum Bone Ash

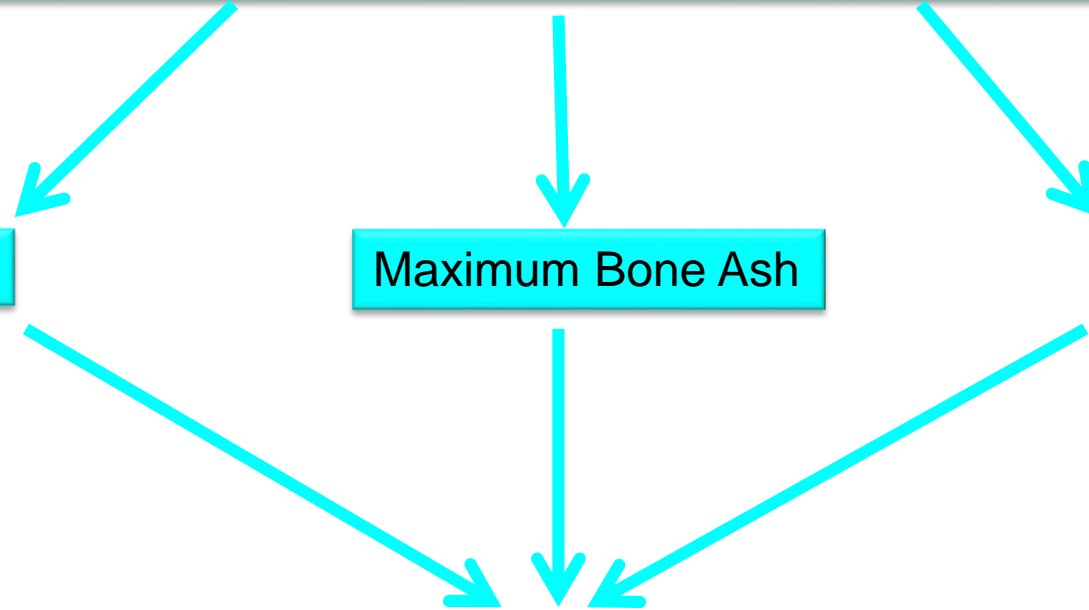
Minimum Leg Abnormalities

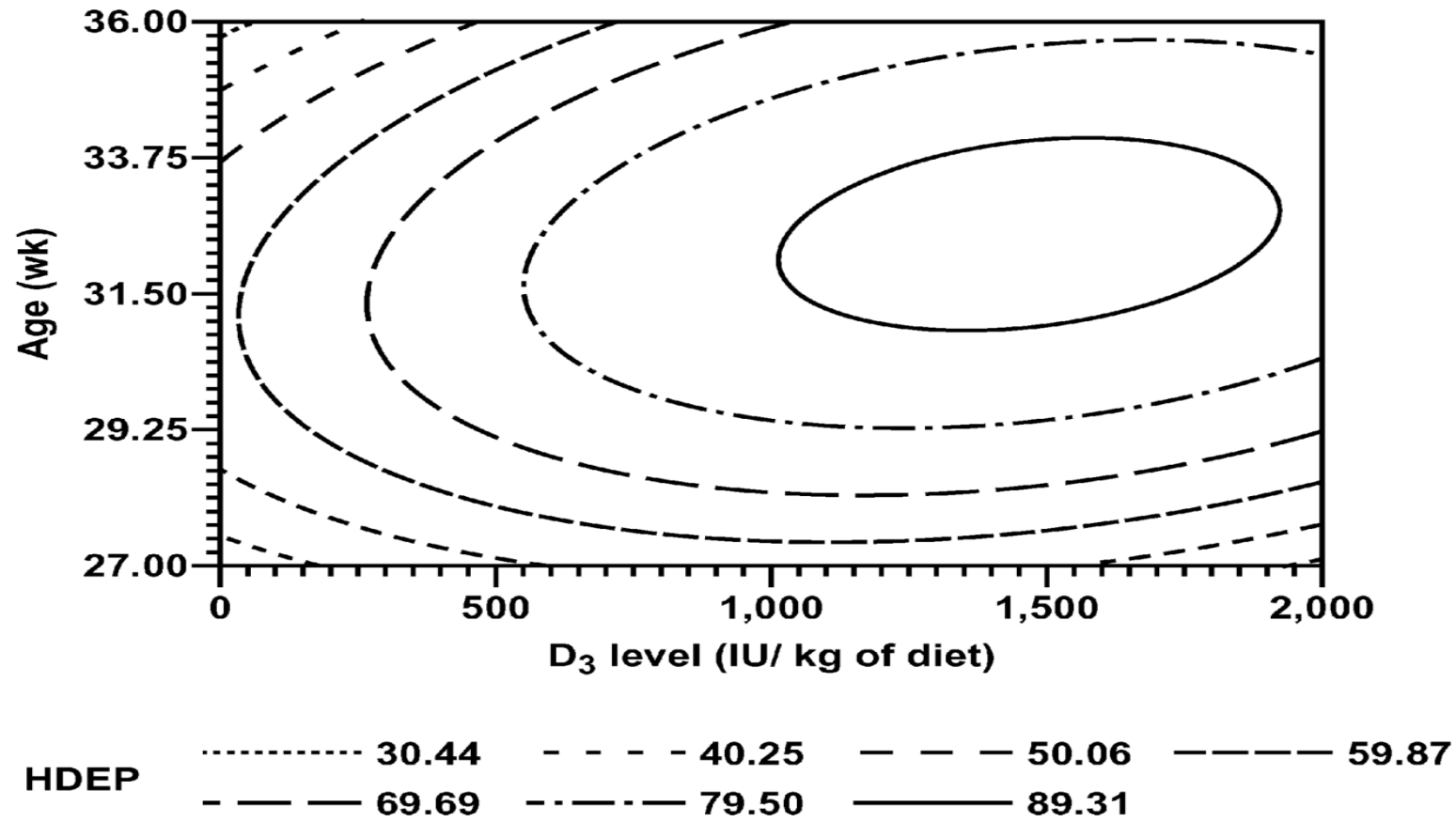
UV light

Level of Other Nutrients

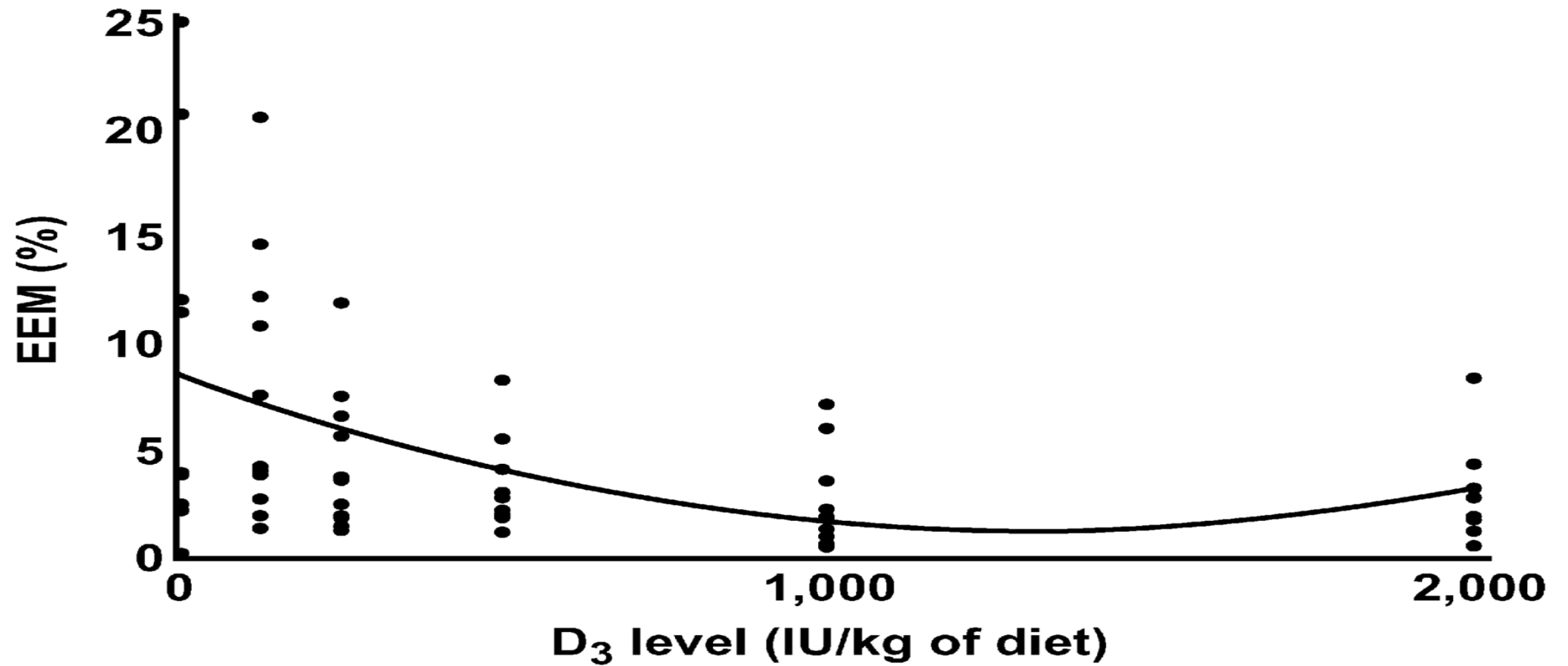
Presence of Animal by-Products in The Basal Diet

Amount of Cholecalciferol Present in the Chick at Hatching

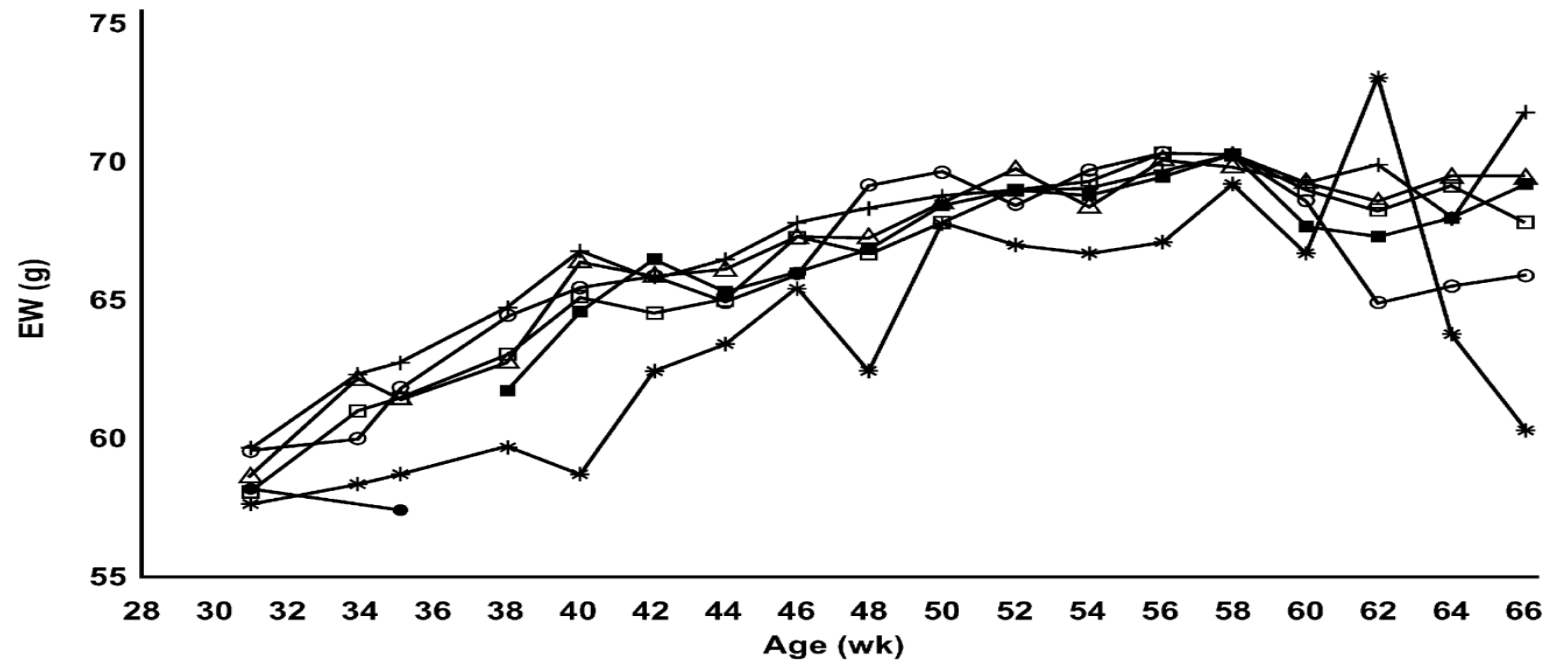




Effect of D<sub>3</sub> levels on hen day egg production (HDEP) of broiler breeders during peak production (contour plot).

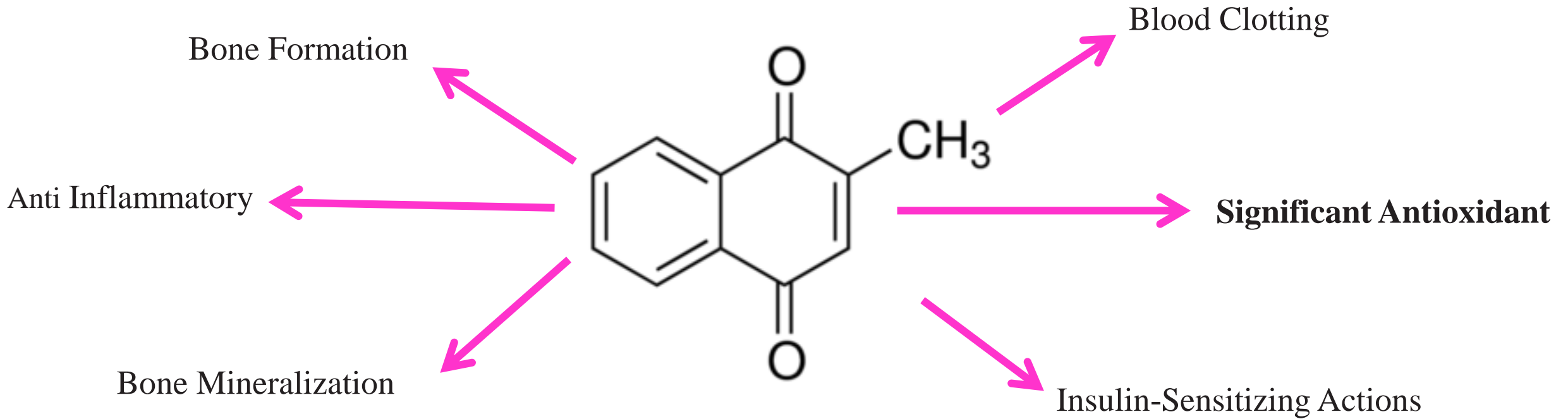


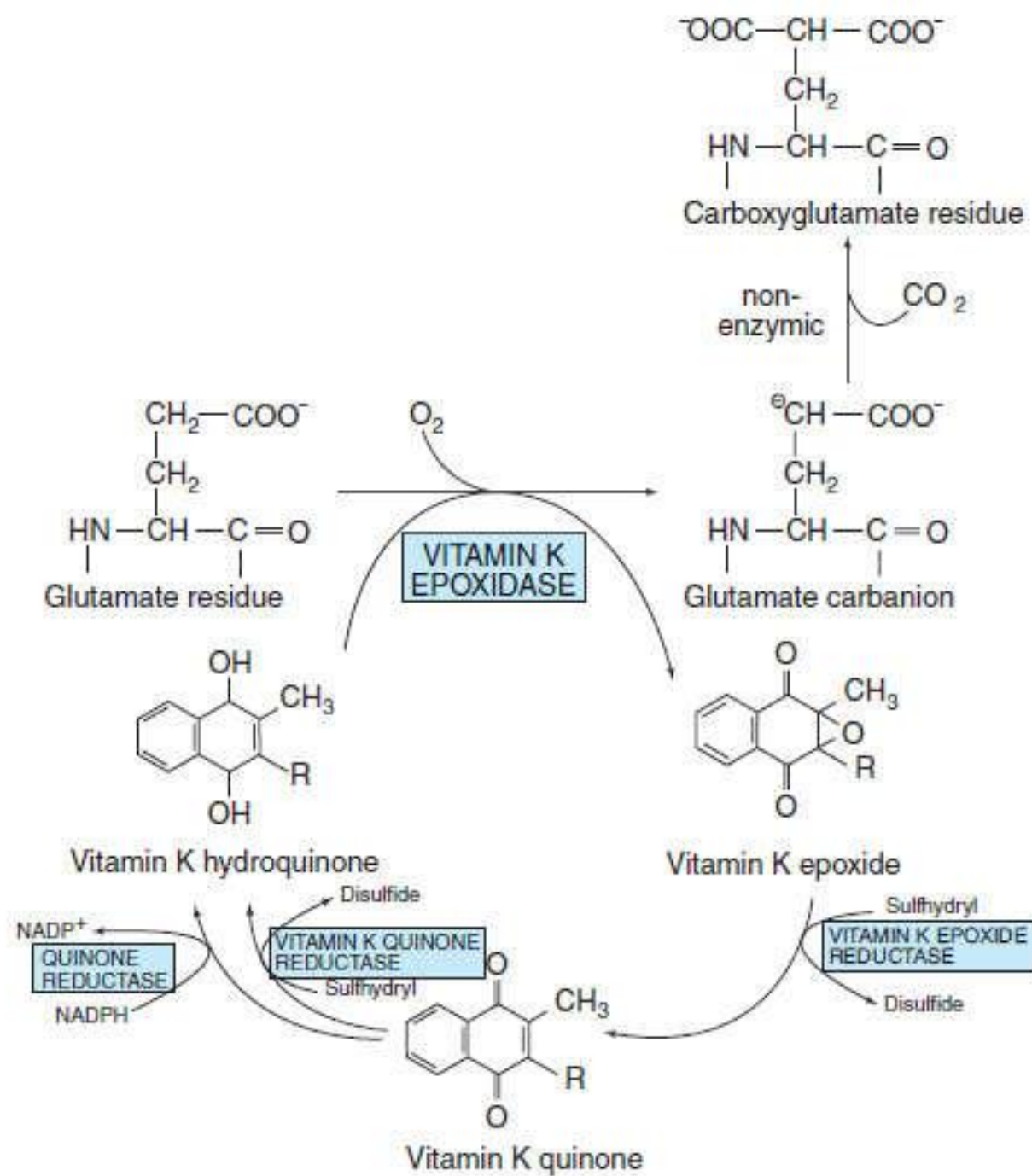
Effect of D<sub>3</sub> levels on early embryo mortality (EEM) of broiler breeders during peak production.



Effect of D<sub>3</sub> level [0 IU/kg of diet (●); 125 IU/kg of diet (\*); 250 IU/kg of diet (○); 500 IU/kg of diet (+); 1,000 IU/kg of diet (△); 2,000 IU/kg of diet (□); 4,000 IU/kg of diet (■)] on egg weight (EW) of broiler breeders from 27 to 66 wk of age.

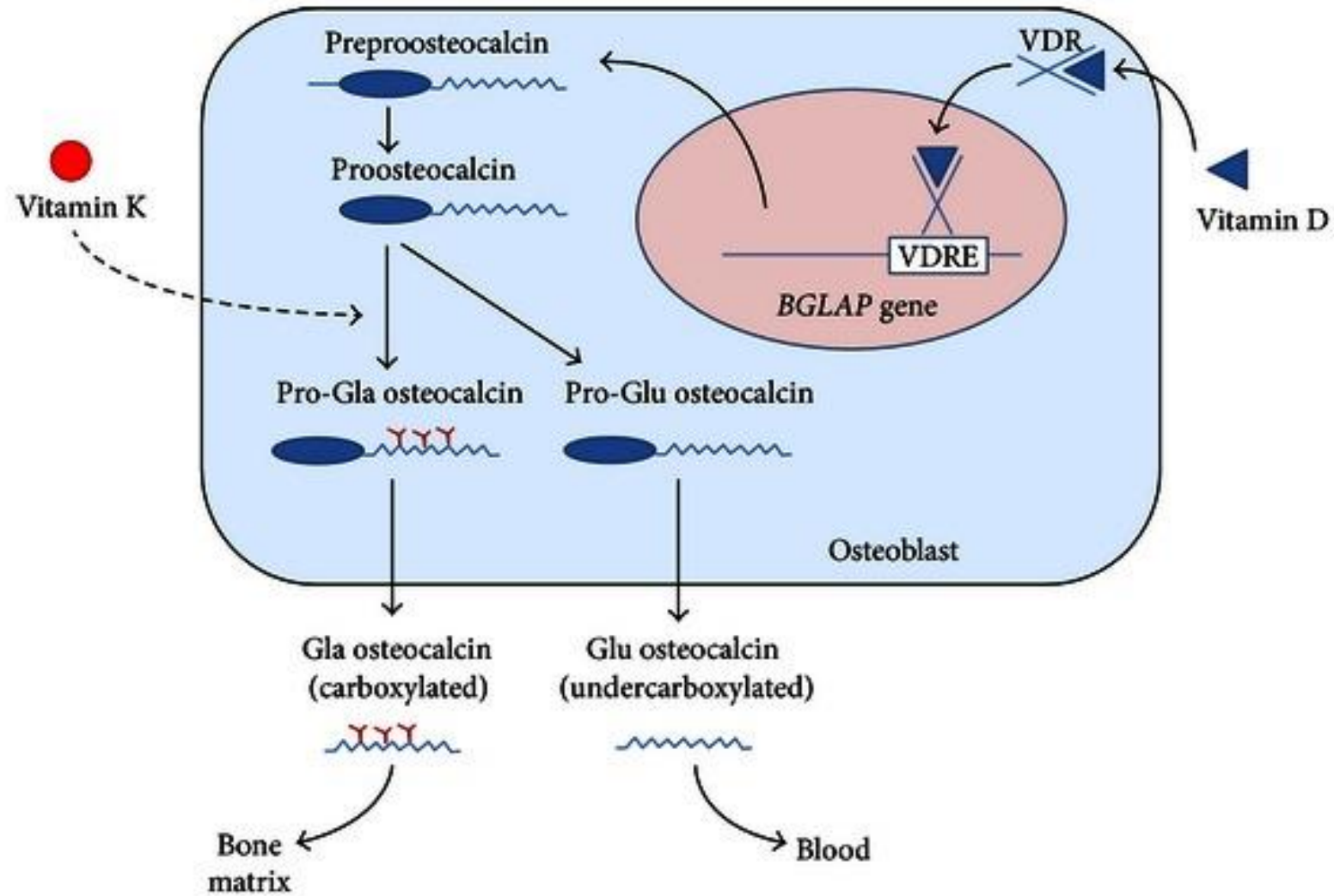
# Vitamin K







Vitamin K deficiency → synthesis of undercarboxylated osteocalcin



Undercarboxylated Osteocalcin → Poor Affinity for Hydroxyapatite → Low Biological Activity → Poor Bone Mineralization

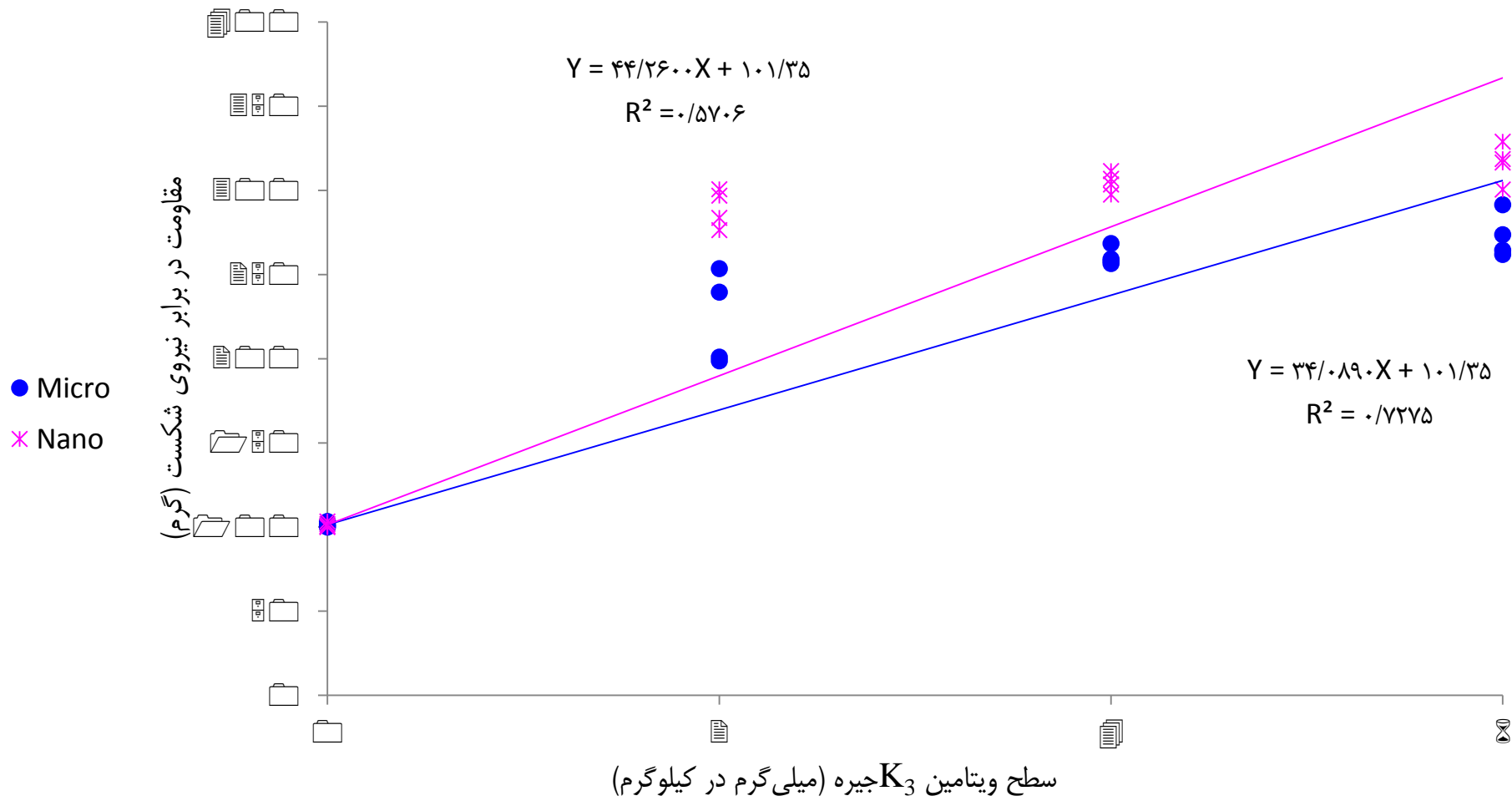
10 mg/ Kg Vitamin K



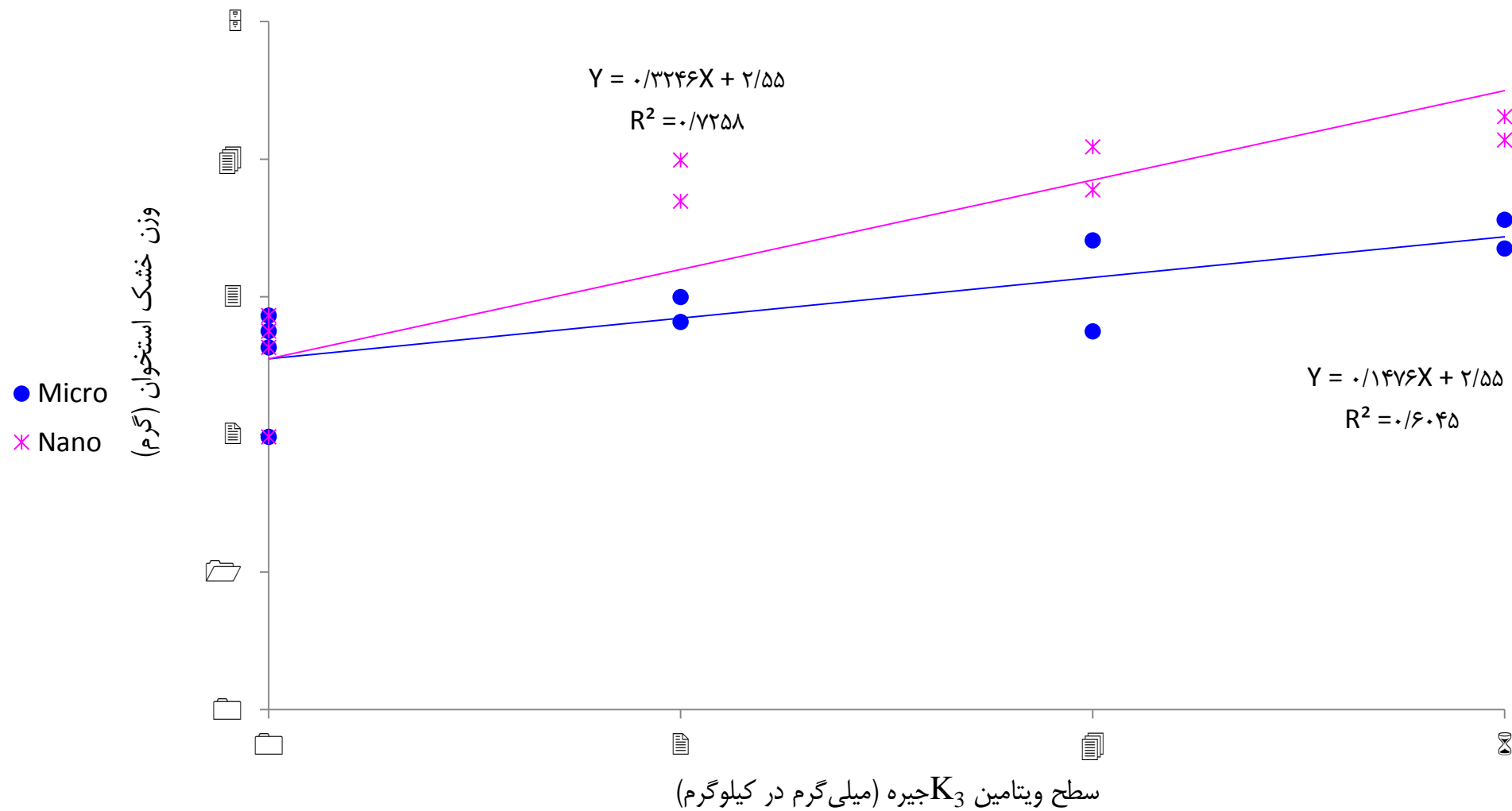
15 and 25 weeks



Deficient item	Embryonic description
Vitamin A	Failure to develop normal blood system, Embryonic malposition
Vitamin E	Reduced fertility, Inadequate embryonic vascular system, Embryonic mortality 1–3 days Oedema (exudative diathesis)
Vitamin D <sub>3</sub>	Rickets, Lack of phosphorus, Stunted chicks and soft bones; resulting from improper calcification of eggshells
Vitamin K	Prolonged embryonic blood-dotting time, Haemorrhages and blood dots in embryo and extra embryonic blood vessels

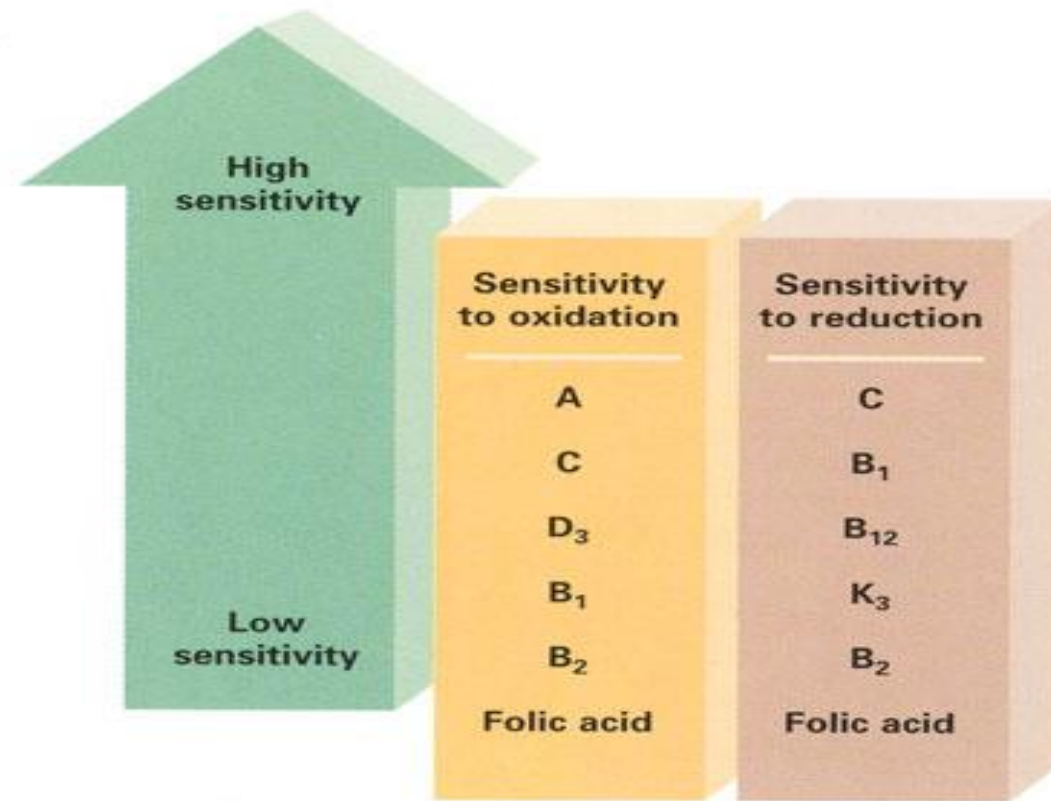


مقایسه زیست فراهمی سطوح مختلف مکمل نانو و میکرو منادیون سدیم بی سولفیت (MSB) در جیره، بر اساس استحکام استخوان درشتنی



مقایسه زیست فراهمی سطوح مختلف مکمل نانو و میکرو ویتامین K<sub>3</sub> در جیره، بر اساس وزن خشک استخوان درشتنی

## Stability of the Product in its Natural State, Premixes and Feeds

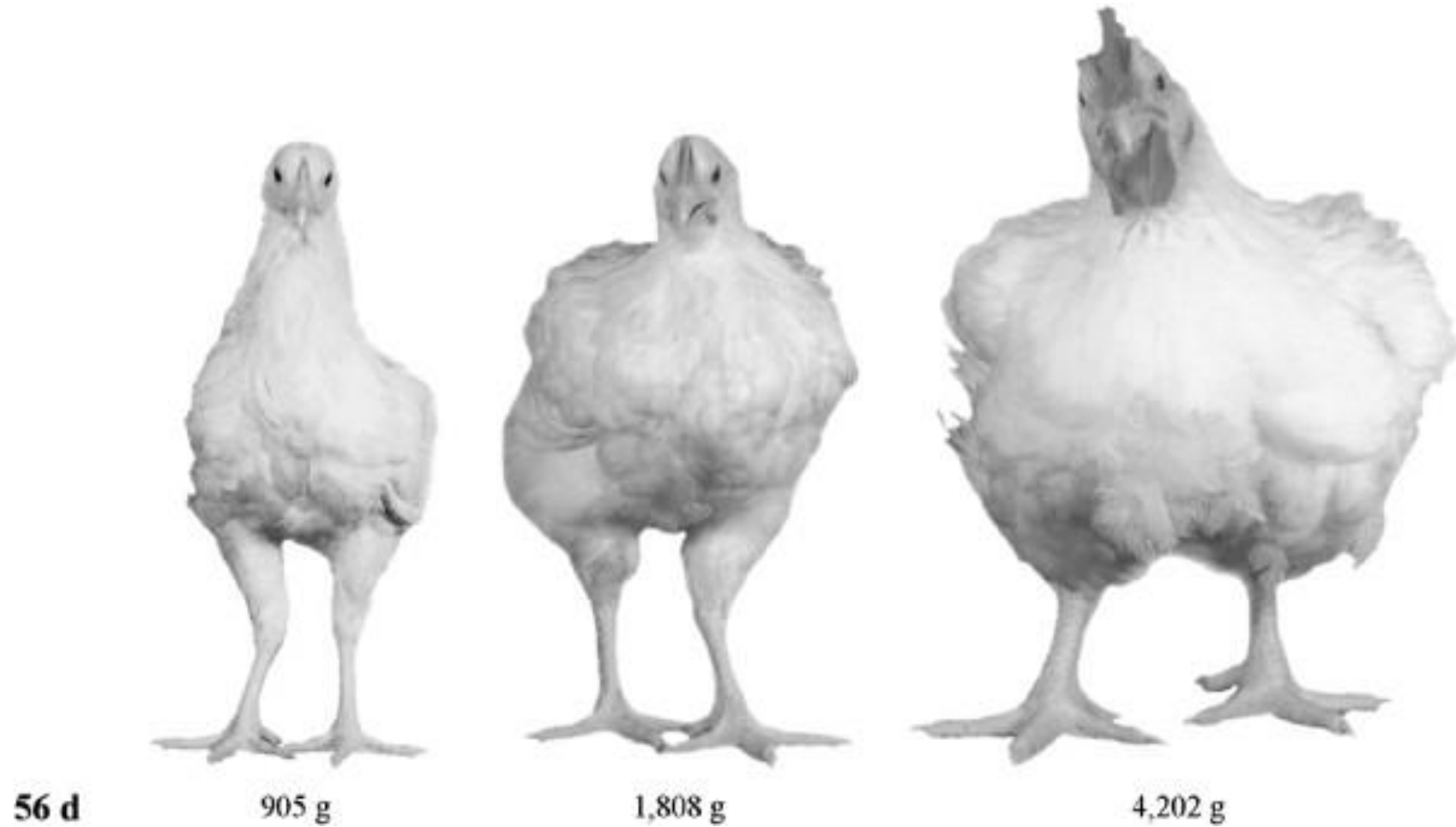


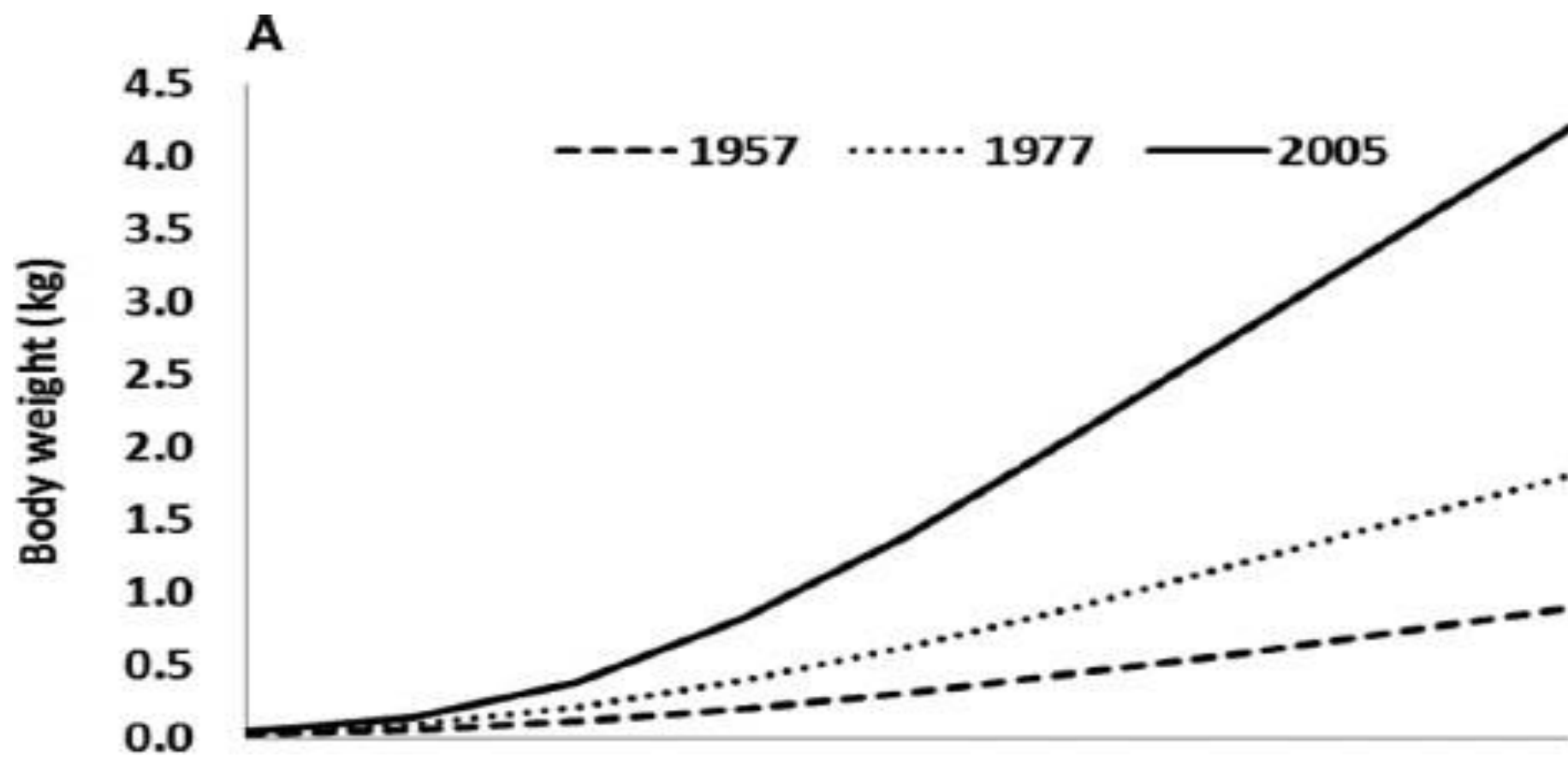
*Sensitivity of vitamins to  
oxidation and reduction*



# **Effect of diet and age on breast muscle characteristics in commercial broilers**

**Generations of broiler chickens have been continuously selected for overall increased size and market weight**





# Poultry Industry Has Recently Been Challenged with a Greater Incidence of Muscular Anomalies Known as Myopathies

**observed in the Pectoralis Major  
Breast Muscle**

**Decreased Meat Quality Traits**

**Increased Cook Loss**

**Decreased Tenderness**

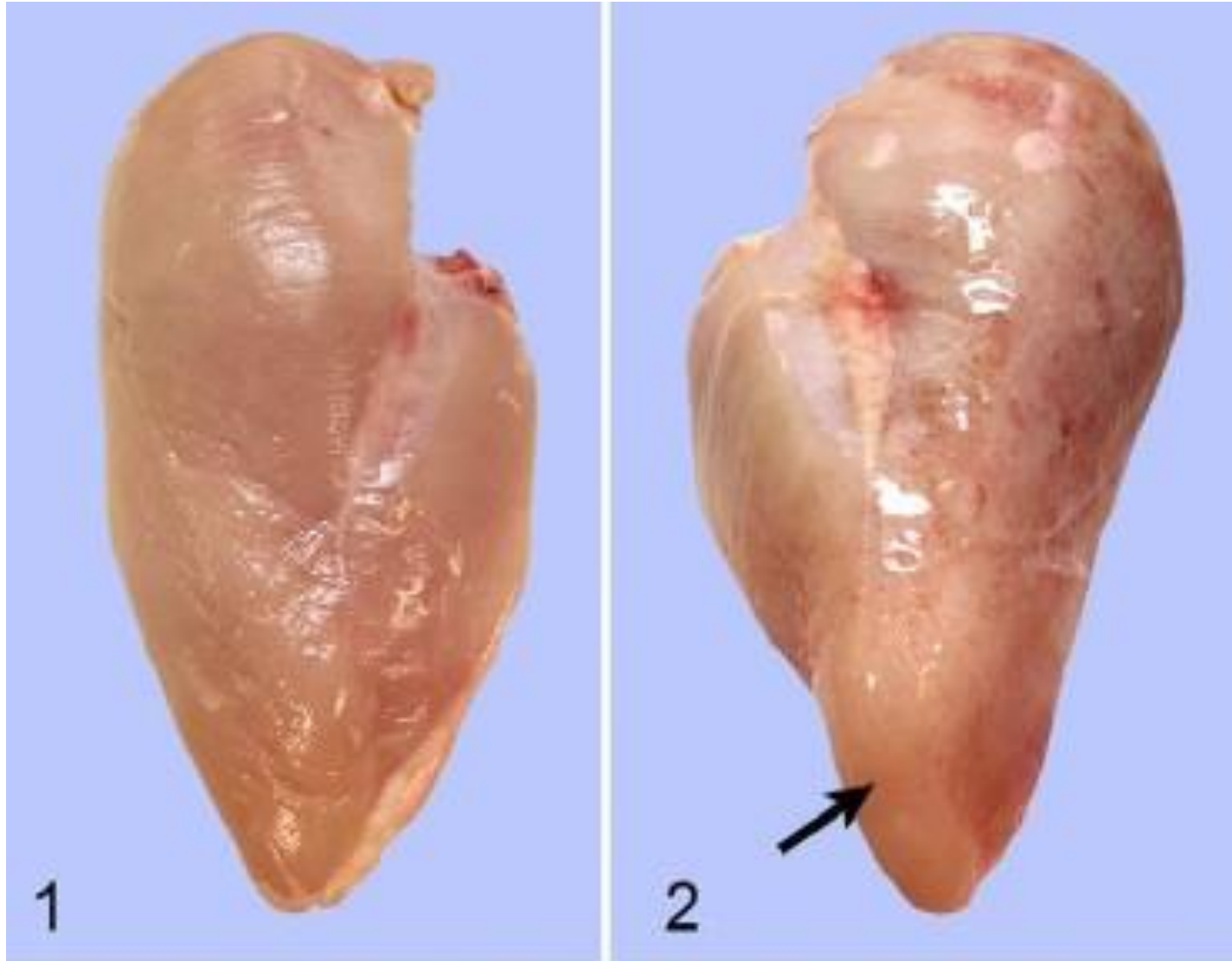
**Overall Poor Eating Experience**

# Two of the Most Prominent Myopathies in the Poultry Industry

**woody breast (WB):** Characterized as the Hardening or Toughening of the Breast Muscle

**white striping (WS):** Characterized as White Striations in the Breast Tissue, Parallel to the Muscle Fibers

Poultry affected by this myopathy have a tough, bulging, and pale breast muscle



WB demonstrates poor palatability, as the meat can be very tough, almost like wood

# WS

**Decreased Water Holding Capacity**

**Tougher Meat**

**Less Juiciness**

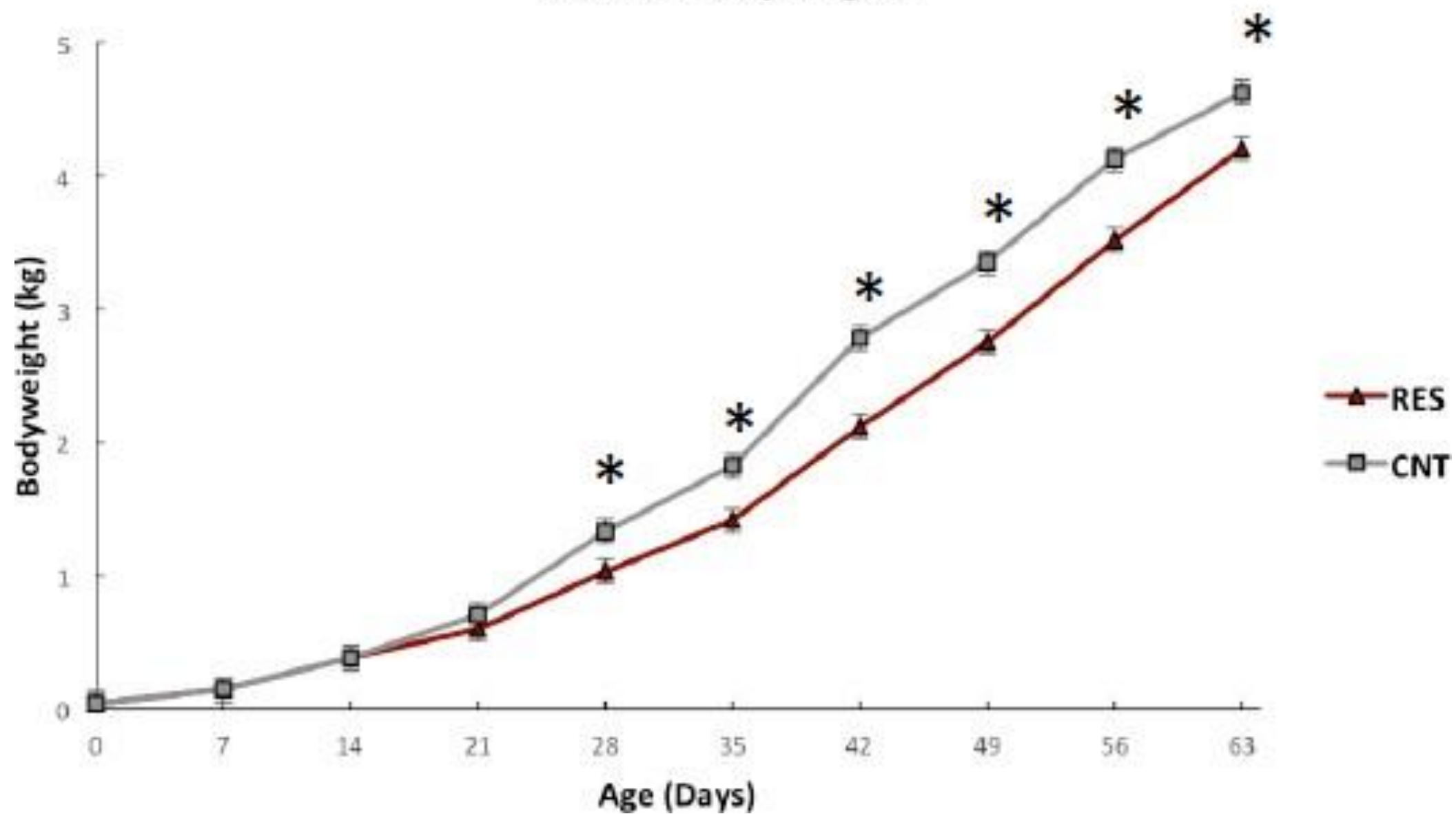




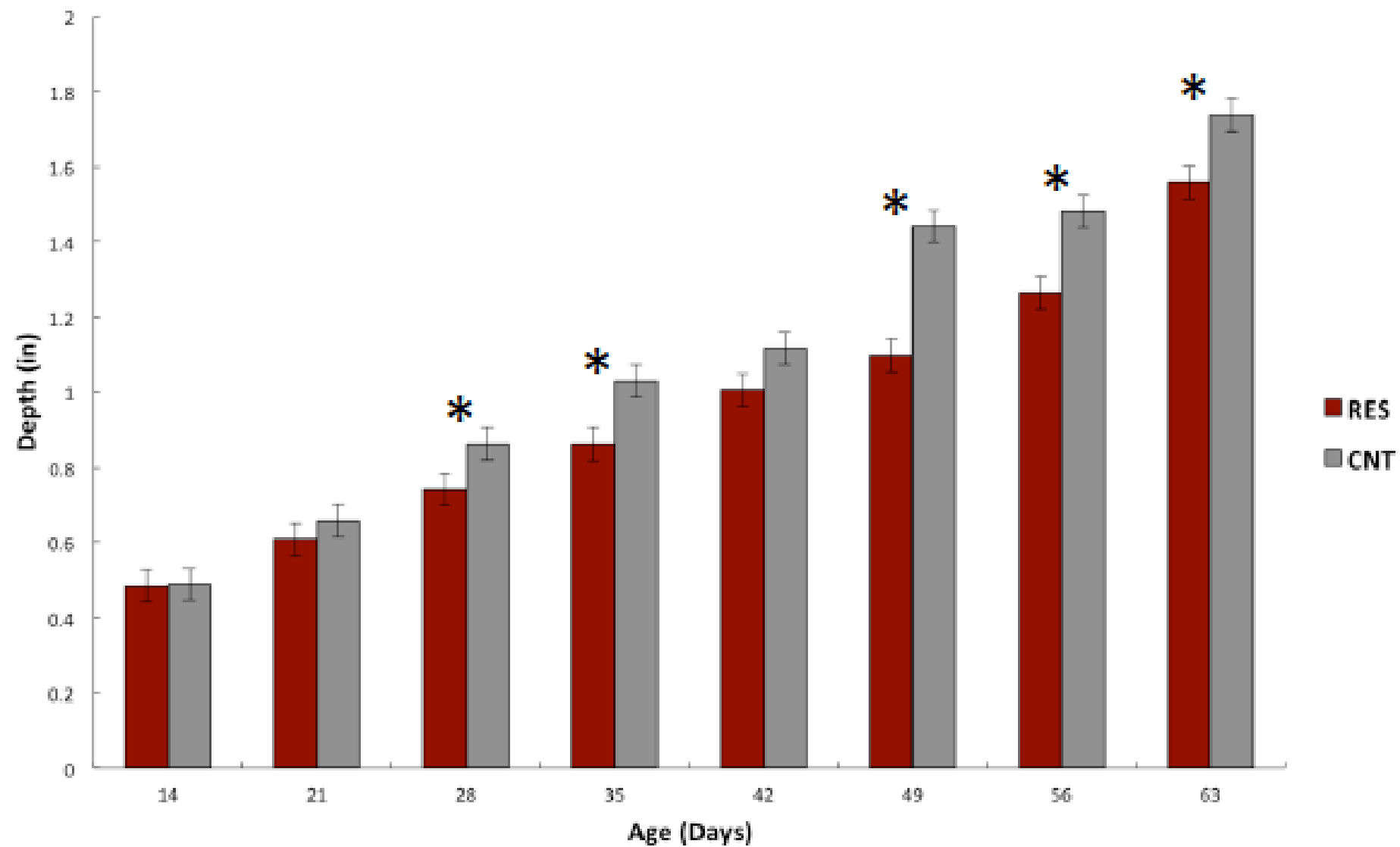
It is generally accepted by most poultry and meat scientists that the rapid growth rate and increase in market weight of modern broilers are contributing factors to these problems

we proposed to restrict feed intake to slow muscle growth. In doing so, we hypothesized that meat quality characteristics would be improved

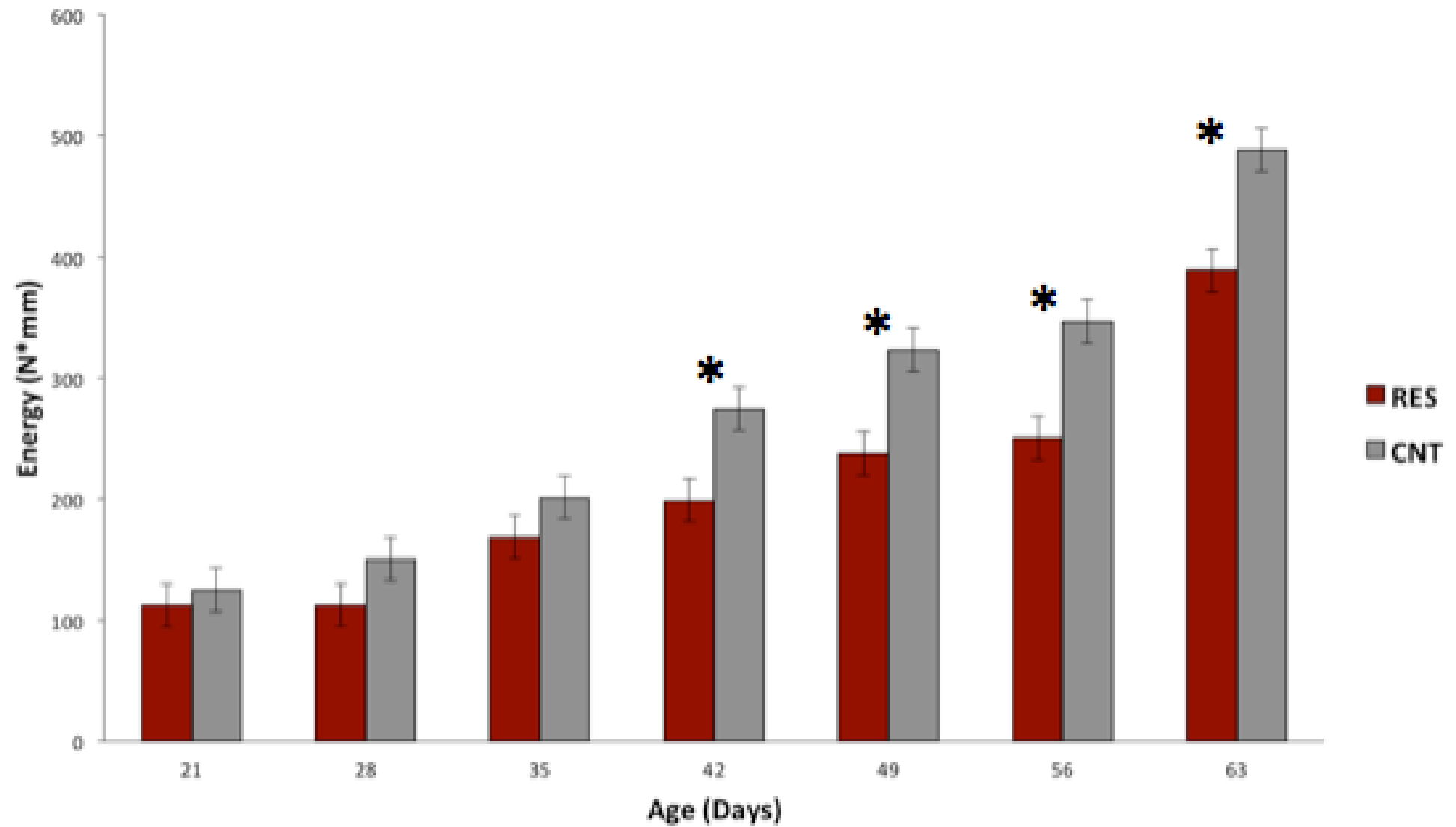
Live bird bodyweights

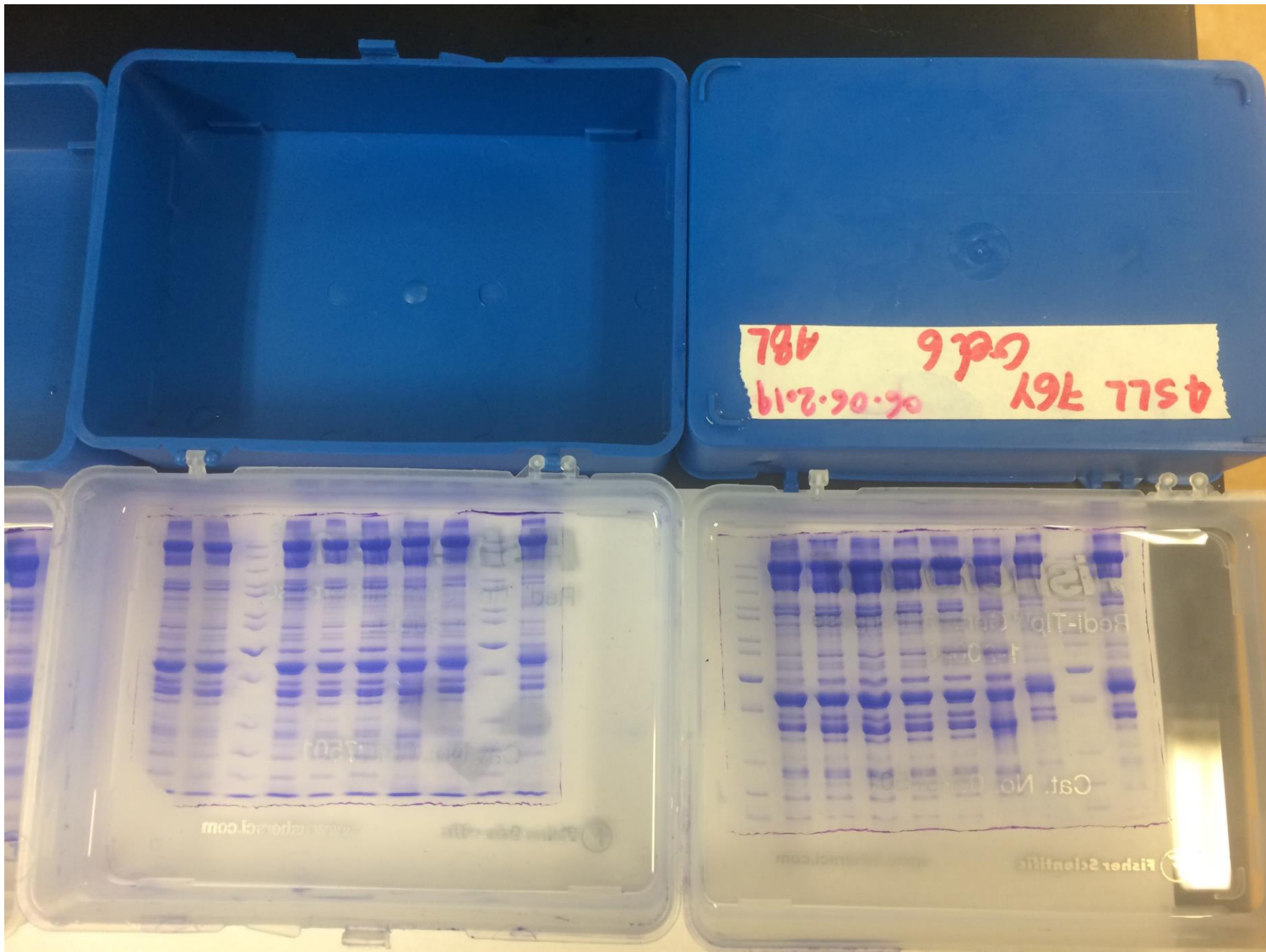


## Breast Depth



## Toughness







تو، ای، نامور، خالق نامدار  
حو حزری نه شایستات آورم  
من آنم که چشم بر انعام توست  
حو باشی دگر من نیاید به کار  
منی هم اگر هست آن من تویی  
ستایش به هر چیز، از آن توست  
مرا جز به درگاه تو راه نیست  
نه لطفی بود آنکه نداشتم  
شده جان در این وادی تن اسیر

به لطف، نکوساز فرجام کار  
مران بر چنین جرم از این درم  
همه هستیم، بر تو نام توست  
منی نیست تا شاید آید شمار  
خدای شدن، هست و بودن تویی  
همان پهنی، نعمت و خوان توست  
ز اسرار، کس جز تو آگاه نیست  
تو را دیدم و خویش انگاشتم  
خدایا خودت را تو از من مکیر



مینا طیور

Minatoyoor.com



مینا  
طیور

پائسی

