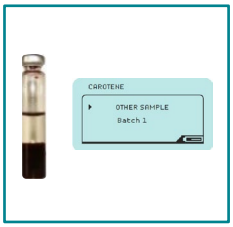
Quick Start Guide for iCheck Carotene

Poultry Whole Blood and Serum Samples

	Steps:	Do nots:
	• Read the iCheck Carotene User Manual before getting started. • Perform "**Device Control**" as instructed in the User Manual.	• *Do not remove the metal cap from the measurement chamber during the self-test.*
	• Collect blood into tubes with or without anticoagulants. • Blood collected without anticoagulant is centrifuged and the serum used. • Carefully draw exactly 400 µL of sample into the syringe.	• *Do not freeze whole blood samples.*
	• Ensure that there are no air bubbles in the syringe. • Carefully inject 400 µL into the reagent vial through the red septum.	• *Do not recap needles to avoid injury.* • *Dispose used needles & syringes in specialized biohazard waste containers and **not** in common waste.*
	• Shake the reagent vial containing the sample vigorously for 10 seconds. • Allow it to stand undisturbed for 5 minutes. • Ensure two distinct phases are visible before measurement.	• *Do not perform the measurement in direct sunlight.*
	• The upper phase should be clear and approximately 1±0.2 cm in height. • Measure the vial using iCheck Carotene in the **"Other Sample"** mode, following the instructions provided in the User Manual.	• *Do not measure the vial if there are particles visible in the upper clear phase.* • *Do not re-use the vial.* • *Dispose used vials as hazardous material.*

- Values obtained with serum are the end results.
- Values obtained with whole blood need to be recalculated by considering the hematocrit value. See next page for details.
- PBS (Phosphate-Buffered Saline)

Further product information:

- https://www.bioanalyt.com/product/carotene/
- https://www.bioanalyt.com/animal-health/

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Calculation when using whole blood :

- Results with whole blood when measured in "Other Mode" on iCheck Carotene must be adjusted with the species-specific hematocrit value following the formula:

Total Carotenoids in whole blood sample=
iCheck Carotene reading with whole blood x (100 / (100-Ht))

- The average hematocrit values in chickens can vary based on factors such as age, sex, breed, and physiological status and can be between 27% to 41%.

Anticoagulants and sample storage

- Anticoagulants, such as EDTA, heparin, sodium citrate, do not interfere with the measurement.
- Whole blood sample can be stored for up to 3 days in the refrigerator (4ºC)
- Serum or plasma can be stored longer term at -20 ºC.

Sample dilution

- If the expected carotenoid concentration in your blood sample exceeds the device's linear range of 0.15 – 15 mg/L, dilute the sample 1:2 with 1x PBS or distilled water.
- The result obtained with iCheck must then be multiplied by the dilution factor (2).

Carotenoids in Poultry

Carotenoids are lipid-soluble pigments found abundantly in plants, algae, bacteria, and fungi, responsible for red, yellow, and orange hues. In poultry nutrition, they play a pivotal role in enhancing health, productivity, and product quality.

Health Benefits: Dietary supplementation of carotenoids has been shown to improve the health status of poultry. These compounds exhibit antioxidant properties, reducing oxidative stress in both pre-hatched and post-hatched birds by quenching free radicals, activating antioxidant enzymes, and inhibiting detrimental signaling pathways. Additionally, carotenoids possess anti-inflammatory, antibacterial, and immunomodulatory effects, contributing to overall bird health.

Productivity Enhancements: Incorporating carotenoids into poultry diets has been associated with improved production performance. Notably, there is evidence of increased egg production and egg weight, alongside a reduction in feed conversion ratio (FCR), indicating more efficient feed utilization. These enhancements are attributed to the bioactive properties of carotenoids, which positively influence metabolic and physiological functions.

Egg and Meat Quality: Carotenoids significantly influence the pigmentation of poultry products. They are responsible for the coloration of egg yolks, skin, legs, beak, comb, feathers, and fat. Uniform and vibrant pigmentation is often perceived as an indicator of product quality and health status. Dietary carotenoids enhance the color intensity of egg yolks and skin, meeting consumer preferences and potentially increasing market value. iCheck Carotene can also be used for measuring carotenoids in egg yolk.

References:

1. *Nabi, Fazul et al. "Health benefits of carotenoids and potential application in poultry industry." J. of an.phys.&nutr. 2020.*
2. *https://www.researchgate.net/publication/340920842_Health_benefits_of_carotenoids_and_potential_application_in_poultry_industry_A_review.*
3. *Yunitasari, Fitri et al. "Performance, Egg Quality, and Immunity of Laying Hens due to Natural Carotenoid Supplementatio." Food sc.of an.res. 2023.*
4. *https://www.dsm-firmenich.com/anh/news/feed-talks/articles/the-pigmentation-of-poultry-products-i-sources-of-carotenoids.html*
5. *K.M.S. Islam, F.J. Schweigert, Comparison of three spectrophotometric methods for analysis of egg yolk carotenoids, Food Chemistry, Volume 172, 2015.*

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