

BLOOD SPOT TEST SPECIFICATIONS

Dehydroepiandrosterone Sulfate

Clinical Information

Dehydroepiandrosterone (DHEA), a hormone produced by the adrenal glands, is the precursor for the production of estrogens and testosterone, and is therefore normally present in significantly greater quantities than all the other steroid hormones. It is mostly found in the circulation in the form of its sulfate ester, DHEA sulfate (DHEA-S), which is measured in blood spot in preference to free DHEA because its circulating levels are higher and more stable. Its production is highest in the late teens to early 20s, and declines gradually with age in both men and women. Levels of DHEA-S reflect adrenal gland function. Low DHEA-S indicates adrenal insufficiency and/or androgen deficiency, and can be associated with reduced libido and general malaise. High DHEA-S levels are seen in hyperadrenal states such as congenital adrenal hyperplasia, and in polycystic ovarian syndrome; high levels in women are associated with masculinizing effects because of its local metabolism to testosterone. DHEA supplementation has been successfully used to treat adrenal insufficiency and can restore normal levels of testosterone in women with androgen deficiency, particularly as a consequence of removal of the ovaries. Because of its conversion to potent estrogens and androgens, levels should be closely monitored during supplementation to avoid excess. The blood spot reference range for DHEA-S in women is 40–290 µg/dL, and for men 70–325 µg/dL.

References:

Worthman CM, Stallings JF. Hormone measures in finger-prick blood spot samples: new field methods for reproductive endocrinology. *Am J Phys Anthropol.* 1997;104(1):1-21.
Allolio B, Arlt W, Hahner S. DHEA: why, when, and how much--DHEA replacement in adrenal insufficiency. *Ann Endocrinol (Paris).* 2007;68:268-73.
Baulieu EE, Thomas G, Legrain S, et al. Dehydroepiandrosterone (DHEA), DHEA sulfate, and aging: contribution of the DHEAge Study to a sociobiomedical issue. *Proc Natl Acad Sci U S A.* 2000;97:4279-84.
Arlt W. Androgen therapy in women. *Eur J Endocrinol* 2006;154:1-11.
Labrie F, Luu-The V, Bélanger A, et al. Is dehydroepiandrosterone a hormone? *J Endo-*

Assay Method: ELISA

Intra-assay Precision

Intra-assay precision was determined by choosing three samples spanning the reference range, and analyzing them multiple times within the same run. Results are shown below:

Mean DHEA-S Concentration (µg/dL)	Standard Deviation	Coefficient of Variation (C.V. %)
38	4.2	11.2
126	6.3	5.0
244	31.5	12.9

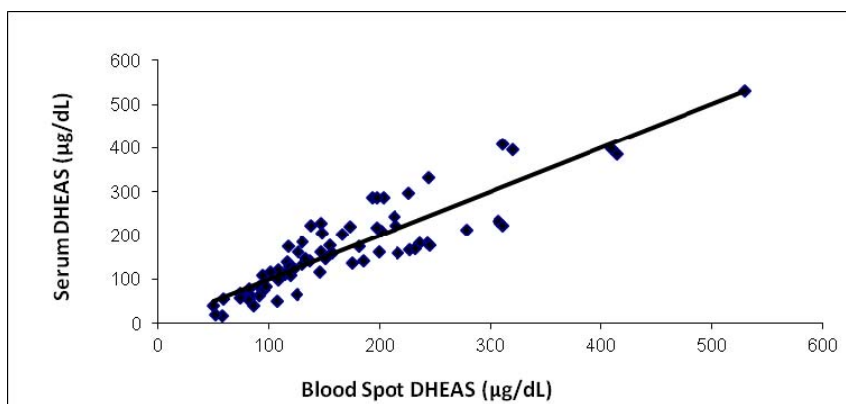
Inter-assay Precision

Inter-assay precision was determined by choosing three samples spanning the reference range, and analyzing them multiple times throughout different runs. Results are shown below:

Mean DHEA-S Concentration (µg/dL)	Standard Deviation	Coefficient of Variation (C.V. %)
58	6.3	10.8
113	4.9	4.4
260	20.3	7.8

Accuracy

To test the accuracy of the dried blood spot assay for DHEA-S, dried blood spot samples collected at the same time as corresponding serum samples were analyzed by linear regression. Resulting correlation data are shown below (R = 0.89):



Analyte Stability

The dried blood spot samples are stable for more than 1 month at room temperature.

Specimen Collection

Kits for blood spot collection contain a filter paper collection card, finger lancets, an alcohol prep pad, sterile gauze, a band-aid, easy-to-follow instructions, and a mailer to return the sample for analysis.