Equine Adrenocorticotropic Hormone (eACTH)

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Contents

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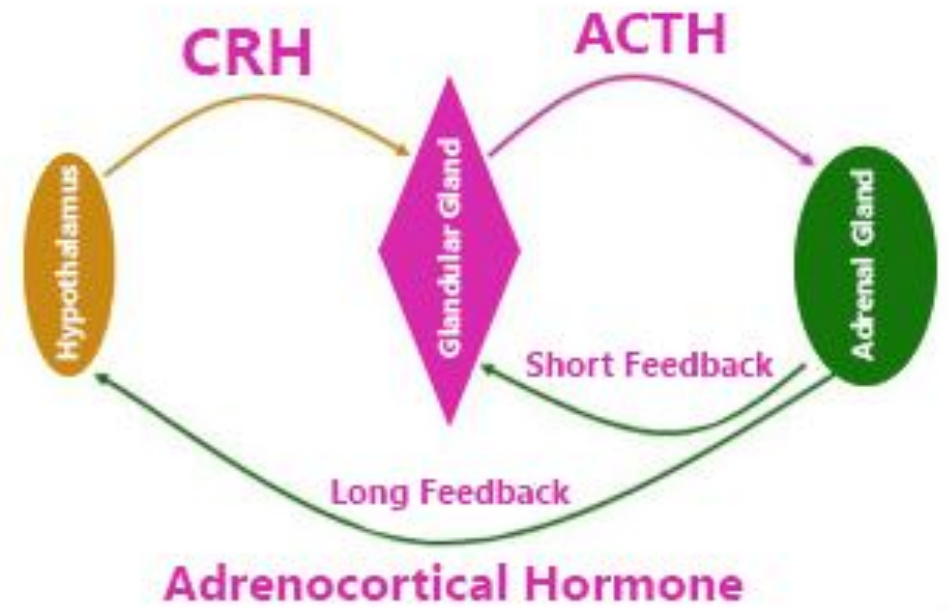
a. Adrenocorticotropic Hormone (ACTH)

Adrenocorticotropic Hormone (ACTH) is a polypeptide hormone secreted by the pituitary gland in vertebrates. It promotes adrenal cortex hyperplasia and the synthesis/secretion of corticosteroids.

- Regulation – ACTH production and secretion are directly controlled by hypothalamic corticotropin-releasing hormone (CRH). Excess corticosteroids exert negative feedback on the pituitary and hypothalamus.

- Function – Stimulates adrenal cortex development and function particularly the zona fasciculata, to enhance glucocorticoid secretion. ACTH also modulates antibody production via the adrenal cortex and antagonises growth hormone.

- Circadian Rhythm – ACTH secretion follows a diurnal pattern, peaking in the morning and declining in the afternoon/evening.



a. Clinical Significance

- Elevated ACTH – Stress, primary adrenal insufficiency, Cushing's syndrome, Nelson's syndrome, congenital adrenal hyperplasia, pituitary ACTH-secreting tumours.

- Reduced ACTH – Hypopituitarism, adrenal cortical tumours, pituitary tumours, anterior pituitary damage.

b. Equine ACTH Testing

Methods:

- ❑ Radioimmunoassay (RIA)
- ❑ Enzyme-Linked Immunosorbent Assay (ELISA)
- ❑ InSight V-IA Equine ACTH Fluorescence Immunochromatography Kit

InSight V-IA Equine ACTH Rapid Quantitative Test

- ❑ Quantitatively detects ACTH in equine serum/plasma.
- ❑ Clinical Applications – Diagnosing pituitary pars intermedia dysfunction (PPID), assessing adrenal function and monitoring stress.
- ❑ Advantages – Rapid results (15 minutes), high sensitivity, user-friendly operation (suitable for field/clinic use).

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b. InSight V-IA eACTH Testing Precautions

Detection Range: 1.0 – 2000 pg/mL / 0.220 – 440 pmol/L
Reference Range (Other Seasons):

Reference	pg/mL	pmol/L
Normal	<25	<5.5
Abnormal	>25	>5.5

Reference Range (Autumn):

Reference	pg/mL	pmol/L
Normal	<75	<16.7
Abnormal	>75	>16.7

Autumn in Southern Hemisphere: March, April, May.

Autumn in Northern Hemisphere: September, October, November.

Interpretation of results must take into consideration stress, illness, pain, season, age, sex and body condition score, as all of these factors can increase concentrations of ACTH.

Each laboratory should establish a reference range that is representative of the population to be evaluated.

Testing Precautions (for reference only, clinical symptoms should be combined)

- ❑ Sampling Time – Use region-specific reference ranges (physiologically elevated thresholds in autumn).
- ❑ Interfering Factors – Stress (e.g., exercise, transport): Transient ACTH elevation; sample after rest.
- ❑ Medications – Glucocorticoids suppress ACTH; discontinue before testing.
- ❑ Diagnostic Limitations – Single ACTH measurements are insufficient; combine with clinical signs (e.g., hirsutism, laminitis), cortisol levels, and functional tests.

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c. Pituitary Pars Intermedia Dysfunction (PPID)

Overview

Also termed Equine Cushing's Disease, caused by reduced dopaminergic innervation to the pituitary pars intermedia, leading to hyperplasia/adenoma formation. Common in aged equids.

c. Early Clinical Features

- Coat Changes: Delayed winter shedding, long/dull hair.
- Metabolic Abnormalities: Altered energy metabolism, muscle wasting, history of equine metabolic syndrome (EMS).
- Regional Adiposity: Fat deposits on the neck, crest and tail base.
- Behavioural Changes: Lethargy, altered temperament.
- Laminitis: Exacerbated by insulin dysregulation.
- Reproductive Issues: Obesity-linked infertility in aged mares; improved fertility with pergolide therapy.

c. Late Clinical Features

- Hirsutism: Prolonged hair growth (>85% of cases), unkempt/curly coat.
- Muscle Atrophy: Progressive loss of muscle mass.

c. Diagnosis

- Late Stage – Hirsutism is pathognomonic; differentiate from chronic systemic diseases, parasitism or malnutrition.
- Early Stage – Requires serum/plasma ACTH testing alongside clinical evaluation.

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Equine ACTH (eACTH) Rapid Quantitative Test

Woodley have developed a rapid, accurate and reliable, highly sensitive detection method for ACTH in horses.

The InSight V-IA eACTH Rapid Quantitative Test is a fluorescence immunoassay used with the InSight V-IA Veterinary Immunoassay Analyser for the quantitative determination of ACTH concentration in equine serum or plasma.

The test is used as an aid to pituitary pars intermedia dysfunction.

It can be stored at room temperature.

Thank You

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