
  
Die „inneren“ Werte  
Welpen und Junghunde

Ilse Schwendenwein  
Abteilung f. Laboratoriumsmedizin  
VMU-Wien



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Blutuntersuchung

- Hämatologie
  - Rotes Blutbild
  - Weisses Blutbild
  - Thrombozyten + Gerinnungsfaktoren
- Klinisch Chemische Untersuchungen



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Klinisch Chemische  
Routineparameter

- **Organfunktionen**
  - Metaboliten
  - Elektrolyten
  - Mineralstoffe
  - Hormone
- **Zellschäden – organspezifisch**
  - Enzymaktivitäten



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## Laborbefund

**Chemie**

Glucose	79.0 mg/dl	55.0 - 90.0
Albumin	3.43 g/dl	2.50 - 4.75
ALT	33 U/L	< 60
GLDH	7.14 U/L	< 13.00
Bilirubin	0.13 mg/dl	< 0.80
Gallensäure	4.0 µmol/L	< 20.0

Parameter      Meßwert      Referenzwert

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## Referenzwerte

- 95% der Meßwerte einer gesunden Population
- Population: Rasse, Alter, Geschlecht, Haltung/Umwelt
- speziesspezifische Referenzwerte

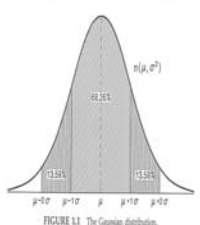


FIGURE 1.1 The Gaussian distribution.

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## Referenzwerte

- 1/20 gesunden Individuen zeigt ein Testresultat außerhalb des Referenzintervalls
- 8 unabhängige Testparameter →
- 66% Chance, daß alle Resultate im Referenzbereich liegen

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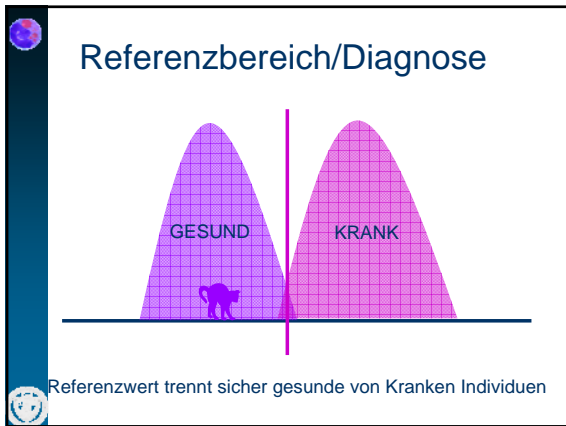
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- ### Entwicklungsstadien
- Augen öffnen 13. LT
  - Drohreflex 5-14. LT
  - Normaler Visus 4 LW
  - Ohren öffnen sich 5. LT
  - Ohren offen 17. LT
  - reichlich abgeschilferte Zellen

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- ### Vitalparameter
- Herzfrequenz 200 /min
  - Atemfrequenz 15-35/min
  - Blutdruck 70/45 mm Hg
  - IKT
    - <2 Wochen 35.5-36°C
    - >4 Wochen 37.7°C

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## Gewichtszunahme

- 2-4 g/ Tag pro kg Erwachsenengewicht
- Verdoppelung des Geburtsgewichts in 2 Wochen
- Gewichtszunahme protokollieren

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## Laborwerte

- Momentaufnahmen
- Entwicklungsabhängig
- Hämatologie
- Nierenwerte
- Leberwerte
- Muskelenzyme
- Mineralstoffe + Spurenelemente

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## Hämatokrit

Zeitpunkt	Hämatokrit (Hkt)
1 LT	~48
1 LW	~40
3 LW	~32
6 LW	~32
12 LW	~40

G. Hosgood, J.D. Hoskins  
Small animal paediatric medicine & surgery

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**Hämatokrit**



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**Körperwachstum + Blutvolumen**

- Erythropoese langsamer als Körperwachstum!
- Niedriger Hämatokrit bei Jungtieren
- Hämatokrit ungeeignet zur Bestimmung des Flüssigkeitsverlustes!
- Hämatokrit unsicher zur Beurteilung von Anämien

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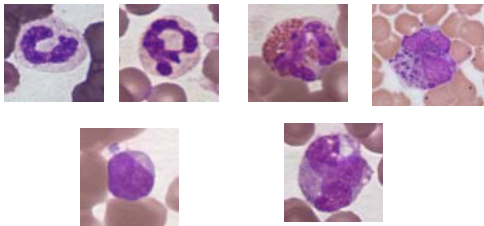
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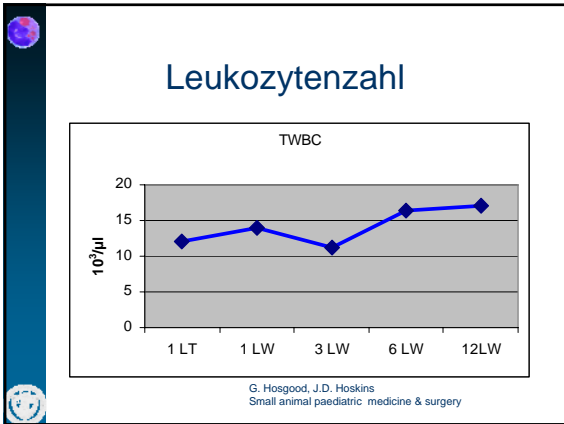
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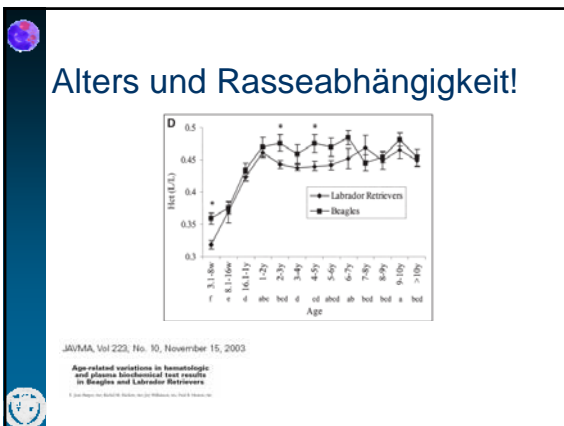
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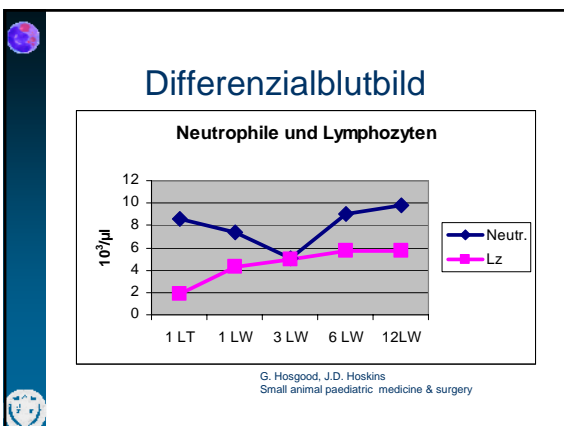
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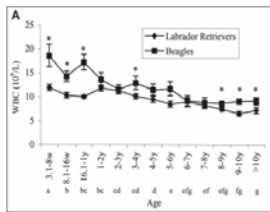
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## Alters und Rasseabhängigkeit!



JAVMA, Vol 223, No. 10, November 15, 2003

Age-related variations in hematologic and plasma biochemical test results in Beagles and Labrador Retrievers

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## Leukozytenzahl

- Physiologische Leukozytose
  - Stressleukozytose
  - Neutrophilie
- Jungtiere
  - Adrenerger Stress ⇔ Lymphozytose

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## Totalprotein

- Synthese in der Leber + Immunsystem
- Screeningparameter
- Dehydratation
- Ödeme
- Ernährungszustand

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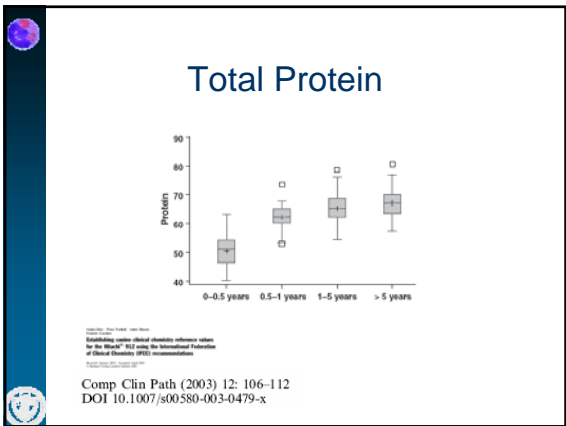
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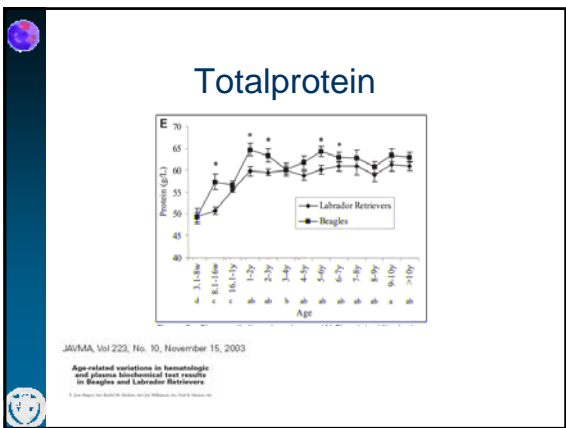
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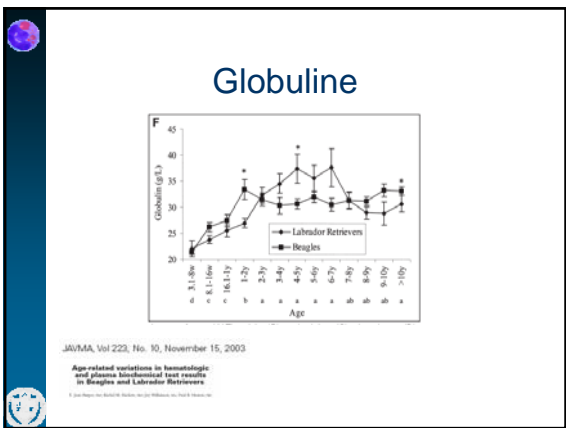
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## Totalprotein - Jungtier

- Keine Ausgangswerte bekannt
- Wenig geeignet zur „Ersteinschätzung“
- Verlaufskontrolle
- Monitoring – Infusionslösungen
- **Kontrollparameter: Gewicht!**

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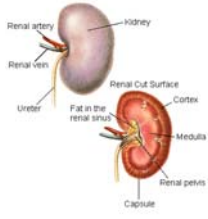
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## Niere

↓ Kompensationsfähigkeit  
 ↑ Anfälligkeit gegenüber  
 Dehydratation  
 Hyperinfusion

- Harnstoff ⇔ Diät
- Kreatinin ⇔ Muskelmasse
- Phosphat ⇔ Wachstum



The diagram shows a kidney with labels for: Renal artery, Renal vein, Ureter, Fat in the renal sinus, Renal Cut Surface, Cortex, Medulla, Renal pelvis, and Capsule.

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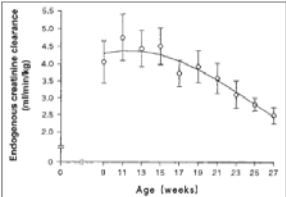
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## Endogene Kreatininclearance



The graph shows a peak in endogenous creatinine clearance around 13-15 weeks of age, followed by a steady decline. The y-axis ranges from 0 to 5.5 ml/min/kg, and the x-axis ranges from 0 to 27 weeks.

Figure 4—Relationship between endogenous creatinine clearance and age in healthy, growing Beagle puppies. See Figure 1 for key.

AJVR, Vol 61, No. 5, May 2000  
 Quantitative urinalysis in healthy Beagle puppies from 9 to 27 weeks of age  
 Inhofe F, Lamm D, Mies M, Dreyer H, Hahn D, Mies M, Stoboy A, Buehler M, Mies W, Drexler M

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## Protein/Kreatinin - Quotient

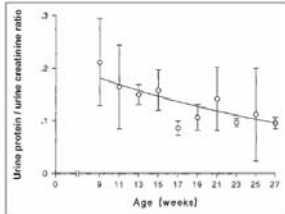


Figure 3.—Relationship between urine protein-to-creatinine ratios and age in healthy, growing Beagle puppies, on the basis of 24-hour collections. See Figure 1 for key.

AJVR, Vol 61, No. 5, May 2000

**Quantitative urinalysis in healthy Beagle puppies from 9 to 27 weeks of age**

Julius F. Law, DVM, MS; David W. Hunt, DVM, MS; Walter A. Bueche, DVM, MS; Alan W. Frankel, PhD

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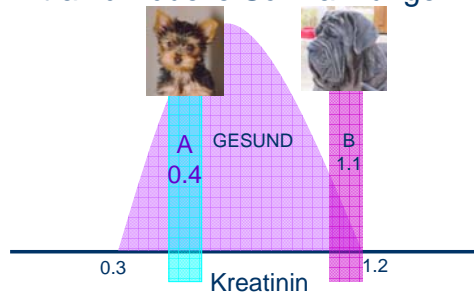
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## Intraindividuelle Schwankungen




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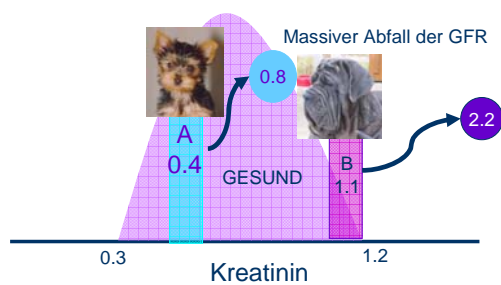
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## Intraindividuelle Schwankung




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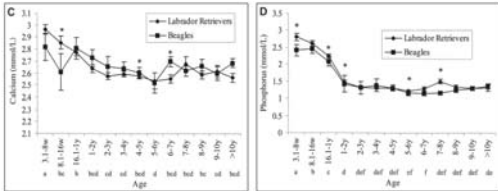
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# Mineralstoffe



JAVMA, Vol 223, No. 10, November 15, 2003

Age-related variations in hematologic and glucose. Mineralized bone masses in Beagles and Labrador Retrievers

J. Van Soest and A. De Vries for JAVMA, Inc. 11/15/03

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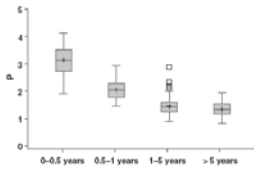
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# Phosphor



Comp Clin Path (2003) 12: 106-112  
DOI 10.1007/s00580-003-0479-x

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# Leber

- Zentrale Rolle im Stoffwechsel
  - Pfortaderkreislauf
  - Immunsystem
  - Glukoneogenese
  - Harnstoffsynthese
    - Detoxifikation von Ammoniak
  - Proteinsynthese

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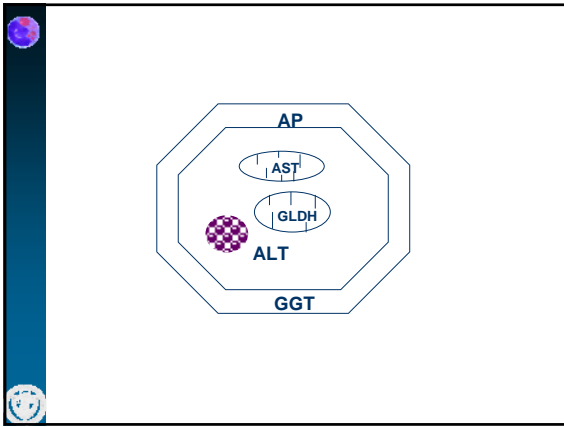
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### Leberenzymaktivitäten

- Leberenzyme
- **Cholestatische Enzyme**
  - ALP alkalische Phosphatase
  - GGT Gamma-Glutamyltransferase
- **AP und GGT im Kolostrum**
- **BIS 2. LW >>>adulte Tiere**
- **AP bleibt erhöht wegen Knochenwachstum**

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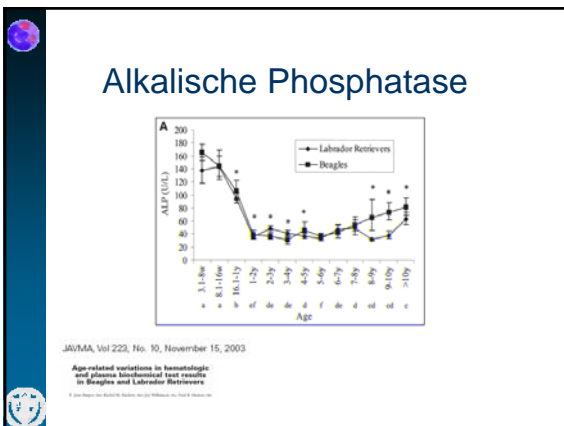
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## Leberenzymaktivitäten

- Leberenzyme
- **Zytosolische Enzyme**
  - ALT Alanin-Aminotransferase
  - GLDH Gutamat-Dehydrogenase
  - AST Gamma-Glutamyltransferase
- Freigesetzt bei Zellschädigung
- **KEINE LEBERFUNKTIONSPARAMETER!**

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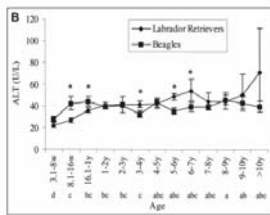
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## ALT



JAVMA, Vol 223, No. 10, November 15, 2003

Age-related variations in hematologic and plasma biochemical test results in Beagles and Labrador Retrievers

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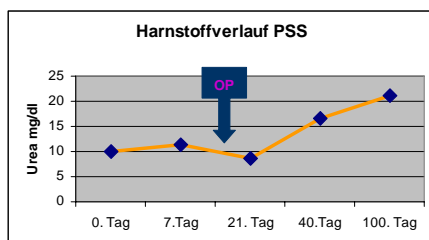
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## Harnstoff PSS




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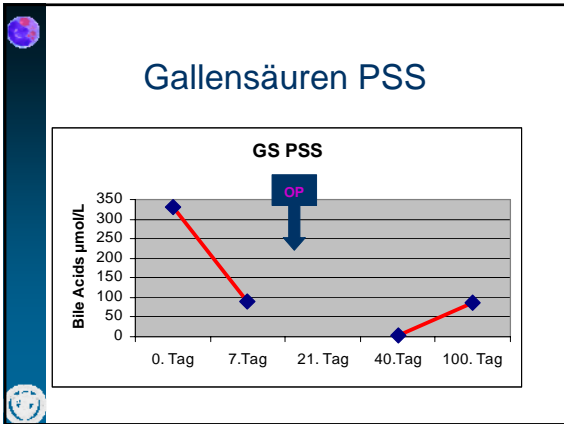
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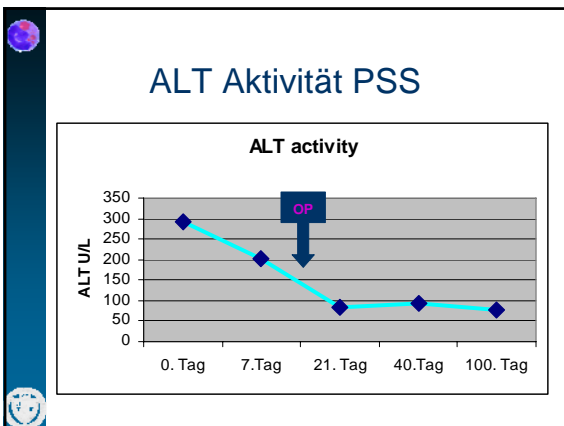
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- ### Hämatologische Veränderungen PSS
- mikrozytäre nicht regenerative Anämie
    - ↓MCV
  - Gelegentlich Hypochromasie
    - Eisenutilisationsstörung

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Danke für Ihre  
Aufmerksamkeit

**FRAGEN?**

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