Formelübersicht

Bestimmung von Körperwasser TBW, Fettmasse FM oder Fettfreier Masse FFM bei Kindern und Jugendlichen

Anthropometrie:

Lohmann (1986): FM (kg) = wt x (5.28/D) – 4.86

Deurenberg et al. (1990): FM (%) = ((562 – 4.2 (age (years) – 2))/D – (525 – 4.7 (age (years) – 2)),
where D is body density:
Jungen: D (g/ml) = 1.690 - 0.0788 x (log (sum of four skinfolds))
Mädchen: D (g/ml) = 1.2063 - 0.0999 x (log (sum of four skinfolds))

Slaughter et al. (1988): **Summe von HFD Subscapula + Triceps > 35mm:**
Jungen: BF (%) = 0.783 x (HFD Subscapula + Triceps) + 1.6
Mädchen: BF (%) = 0.546 x (HFD Subscapula + Triceps) + 9.7
Summe von HFD Subscapula + Triceps < 35mm:
Jungen: BF (%) = 1.21 x (HFD Subscapula + Triceps) – 0.008 x (HFD Subscapula + Triceps)2 + k*
Mädchen: BF (%) = 1.33 x (HFD Subscapula + Triceps) – 0.013 x (HFD Subscapula + Triceps)2 – 2.5

Bioelektrische Impedanz Analyse:

Cordain et al. (1988): FFM = 6.86 + 0.81 x (Ht^2/R) (Ht in cm)

Davies et al. (1988): TBW = -0.5 + 0,60 x (Ht^2/R) (Ht in m)

De Lorenzo et al. (1998): FFM = 2.33 + 0.588 x (Ht^2/R) + 0.211 x wt (Ht in cm)

Deurenberg et al. (1989) FFM = 0.430 x 104 x Ht^2/R + 0.354 x wt + 0.9 x sex (sex: 1 = männlich, 2 = weiblich; Ht in m)

Deurenberg et al. (1990): **Mädchen und Jungen (7-9 Jahre):** FFM = 0.640 x 104 x (Ht^2/R) + 4.83
Mädchen (10-12 Jahre) und Jungen (10-15 Jahre): FFM = 0.488 x 104 x (Ht^2/R) + 0.221 x wt + 12.77 x Ht – 14.7
Mädchen älter als 13 und Jungen älter als 16 Jahre:
FFM = 0.258 x 104 x (Ht^2/R) + 0.375 x wt + 6,3 x sex + 10.5 x Ht – 0.164 x age – 6.5
(sex: 1 = männlich, 2 = weiblich; Ht in m)

Fjeld et al. (1990): TBW = 0.76 + 0.18 x /Ht^2/R) + 0.39 x wt (Ht in cm)

Houtkooper et al. (1989): FM (%) = -1.11 x (Ht^2/R) + 1.04 x wt + 15.16 (Ht in cm)

Houtkooper et al. (1992): FFM = 0.61 x (Ht^2/R) + 0.25 x wt + 1.31 (Ht in cm)

Kushner et al. (1992): TBW = 0.593 x (Ht^2/R) + 0.065 x wt + 0.04 (Ht in cm)

Schaefer et al. (1994): FFM = 0.65 x (Ht^2/R) + 0.68 x age + 0.15 (Ht in cm)

Wabitsch et al. (1996): TBW = 0.35 x (Ht^2/R) + 0.27 x age + 0.14 x wt – 0.12 (Ht in m)

Wühl et al. (1996): TBW = 1.99 + 0.144 x (Ht^2/R) + 0.40 x wt (Ht in cm)

Anthropometrie kombiniert mit Bioelektrischer Impedanz Analyse:

Goran et al. (1996): FFM (kg) = (0.16 x (Ht^2/R)) + (0.67 x wt) – (0.11 x TSF (mm)) – (0.16 x SSF (mm) + (0.43 x sex) + 2.41 (sex: 1 = männlich, 2 = weiblich; Ht in cm)

Definition:
wt = weight (kg); Ht = height (in m oder cm); TBW = Total Body Water in l; FFM = Fat-Free-Mass in kg; FM = Fat Mass bzw.
BF = Body Fat = Weight – FFM; TSF = Triceps Skinfold Thickness (mm); SSF = Subscapular skinfold thickness (mm);
Age = years; HFD =Hautfaltendicke; k* = Konstante nach Tanner-Reifestadium