BODYGEE

Body Composition Measurement Methods

		Measurement	Approach/Assumption	Outcomes	Accuracy*	Pros	Cons
LABORATORY METHODS	**Magnetic Resonance Imaging (MRI) / Computed Tomography (CT)**	Anatomical images	Series of cross-sectional images allow quantitative assessment of tissue	• Body fat • Muscles • Bones • Organs • Other internal tissues	"Gold Standard"	Today's most precise and accurate methods	Very expensive Requires long analysis process Difficult to access Exposure to radiation (CT)
	Dual Energy X-ray Absorptiometry (DXA)	X-rays	Different human tissue attenuate X-rays differently	• Body fat • Bone mineral mass • Fat-free/lean mass	"Gold Standard"	More cost and time-efficient than MRI/CT	Exposure to a small dose of radiation Difficult to access
	Hydrodensitometry (Underwater Weighing) / Air Displacement Plethysmography (ADP)	Body density	Lean mass has a different density compared to fat mass	• Body fat • Fat-free mass	Former "Gold Standard"	Based on simple calculations Cheaper and more widespread than other laboratory methods	Subjects are involved to a large extent Less accurate than other laboratory methods
FIELD METHODS	**BODYGEE 3D Photonic Scanning**	Digitized anthropometry Optical visualization	Anthropometric characteristics and body composition are linked	• Circumferences • Body Shape • Posture • Body fat • Fat-free mass • Waist to hip ratio • Resting metabolic rate	Deviations of <3% body fat compared to laboratory methods	Includes visual feedback Less error-prone than other field methods Requires less stringent preparation Digitized anthropometry allows high precision	Results can be affected by variations in clothing and pose
	Bioelectric Impedance Measurement (BIA)	Body water	The amount of body fat can be estimated, based on its water content	• Body water • Body fat • Fat-free mass • Device-specific outcomes* *calculated from body water measurement: i.a. (segmental) lean mass, body water composition	Deviations of <4.5% body fat compared to laboratory methods Deviations of <8% body fat between devices	Rapid Easy to apply	Results can be affected by hydration status (food intake, exercise) and measurement procedure (type of device, sensor placement)
	Skinfold Thickness Measurement (Caliper)	Skinfold thickness	Thickness of subcutaneous fat is related to total body fat	• Body fat • Fat-free mass	Deviations of ~9% body fat compared to laboratory methods	Affordable Not demanding	Needs trained personnel to ensure precision Physically uncomfortable

*The accuracy is based on the current scientific literature