

MANGANESE

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- **12 - 20 mg in organism, predominantly in mitochondria**
- **Mn/S = 7 – 27 nmol/l
0.5 – 1.5 µg/l**
- **RDI**
- **2 - 5 mg /d**
- **tea, grains, cocoa, nuts, ginger, parsley, blueberries**

Metabolism

- **Absorption: 3-5%**
- **Transport:** in plasma bound to α -2-macroglobulin, in ercs to Hb, in liver to transferrin and transmanganin
- **Excretion:** **faeces: 0.8 - 1 μ g/d** (bile, pancreatic and shed-mucosal Mn)
urine: 0.1 – 1.4 μ g /kg /d

Function

- **glukosaminoglykans synthesis (bones and cartilages)**
- **mitochondrial Mn-SOD 2 ($\text{Mn}^{2+} \leftrightarrow \text{Mn}^{3+}$)**
- **pyruvate carboxylase, arginase, ALP**
- **cholesterol synthesis**
- **synthesis and activation of protrombin**
- **insulin synthesis**
- **participation in oxidative phosphorylation**

Deficiency

- **bone defects**
- **skin changes**
- **neurological symptoms**
- **coagulation disorders**
- **disorders in lipoprotein formation**

Toxicity

- **in workmen with manganese ore, KMnO_4 poisoning**
- **orally: emesis, diarrhoea**
- **inhalation : pneumonia, irreversible affection of basal ganglia**