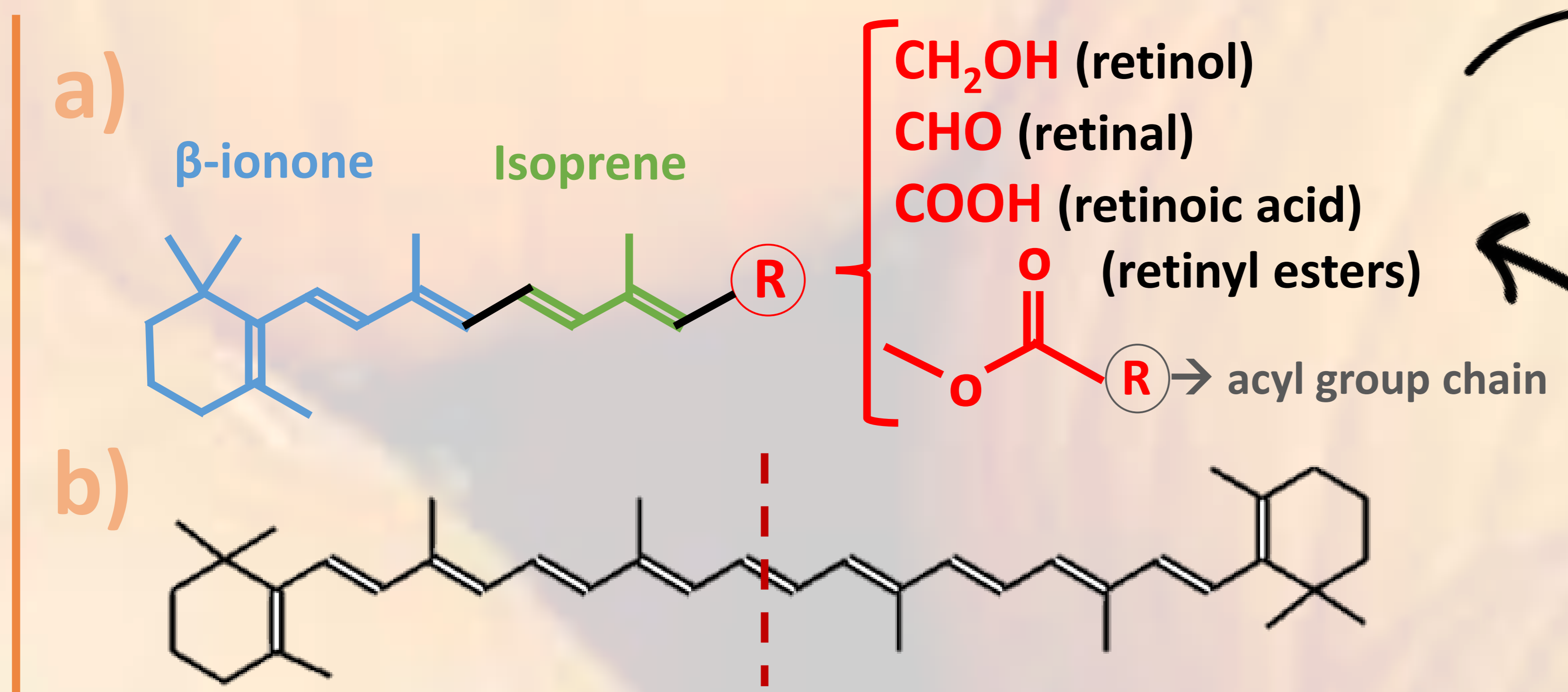


## AIMS

1. To describe the chemical structure.
2. To present the main food sources.
3. To understand the absorption and metabolism.
4. To explain the biological functions and the effects of vitamin deficiency.
5. To analyse the vitamin loss in food processing.

## 1. Chemical structure



## 3. Absorption and metabolism

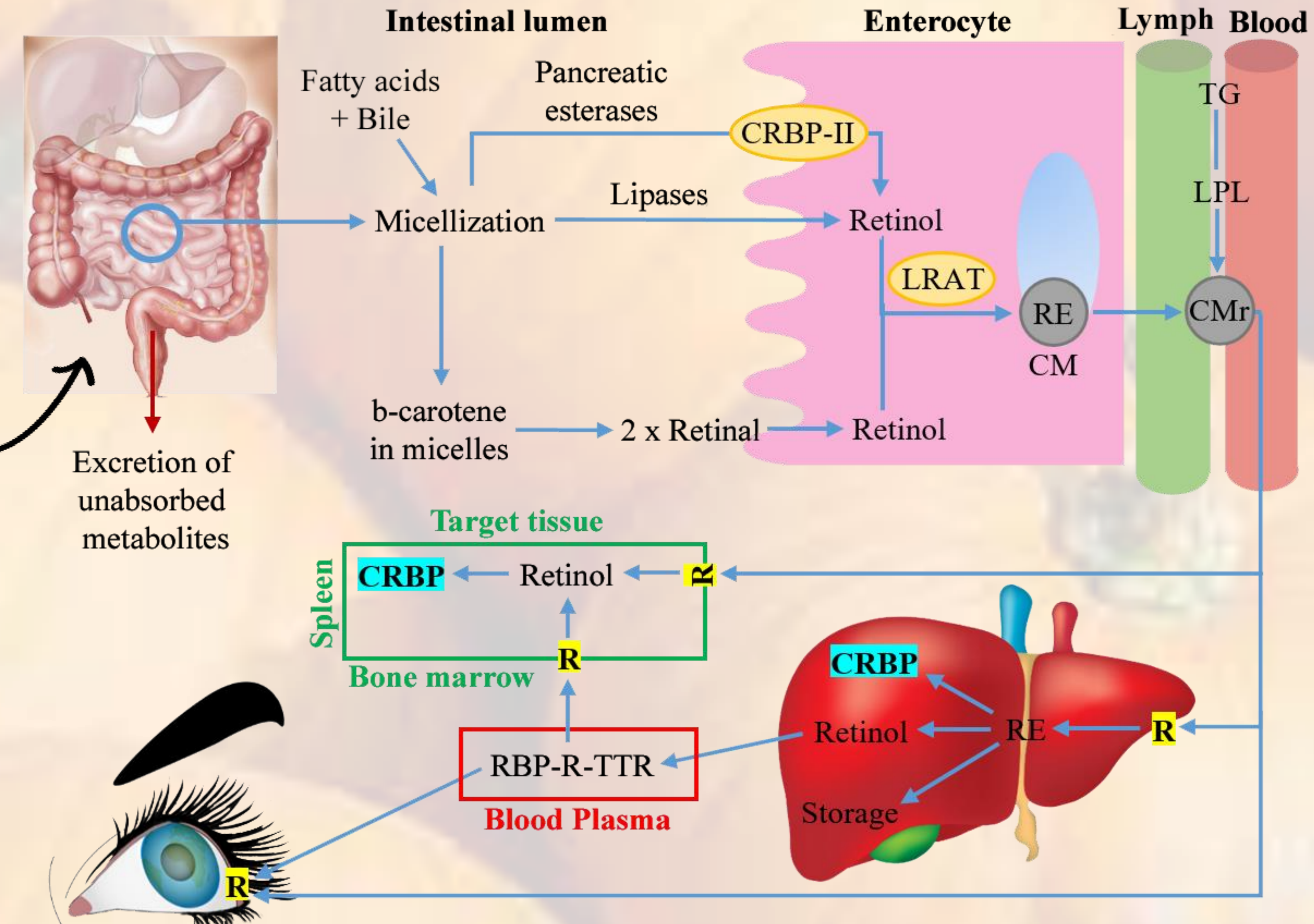


Figure 3. Absorption, transport, metabolism, storage and elimination of vitamin A. CRBP: Cellular Retinol-Binding Protein; LPL: Lipoprotein lipase; LRAT: Lecithin Retinol Acyltransferase; CM: Chylomicron; CMr: Chylomicron remnant; R: Receptor; RBP-R-TTR: complex formed by the union of transthyretin to the Retinol-Binding Protein; RE: Retinyl Esters; TG: Triglyceride.

## 4. Vitamin deficiency

- Nyctalopia
- Xerophthalmia
- Infections
- Skin diseases

## 5. Precautions in food processing (Mataix 2010)

- Isomerization
- Autoxidation  $\left\{ \begin{matrix} [O_2] \\ pH < 7 \\ Fe^{3+} \\ Cu^{2+} \end{matrix} \right.$

## CONCLUSIONS

1. All forms of vitamin A have a beta-ionone ring and an isoprenoid chain with conjugated double bonds and a terminal functional group.
2. Vitamin A is found as carotenoids in fruit and vegetables and as retinol in animal products.
3. Dietary carotene and retinol are absorbed and hydrolysed by digestive enzymes and assimilated as free retinol. Part of it is stored within the liver and other target organs. The rest is excreted mainly in urine, faeces and lungs.
4. It is involved in regulating the proper functioning of vision, cell differentiation, development and immunity. Its deficiency is associated with nyctalopia, xerophthalmia, infections and skin diseases.
5. Autoxidation and isomerization reactions are the main causes of vitamin loss in food processing.

## 2. Food sources

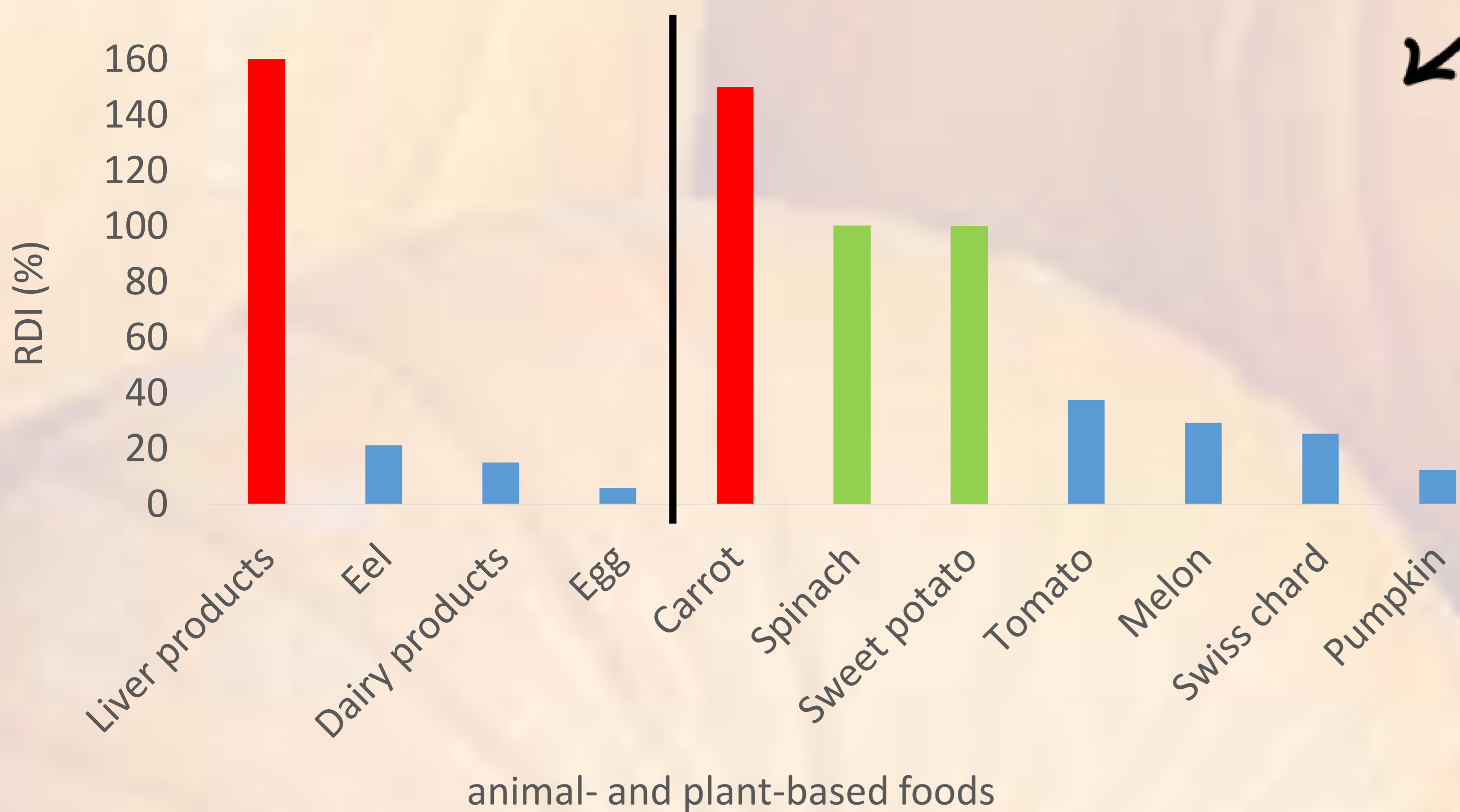


Figure 2. Comparison of vitamin A content of some foods.

## Main references

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