

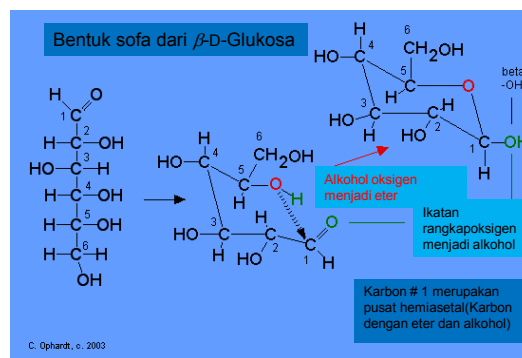
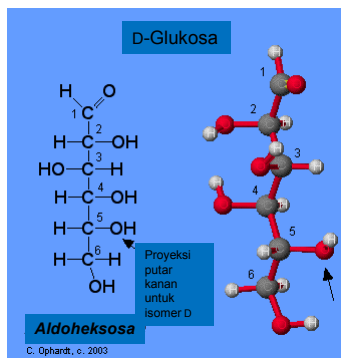
# Karbohidrat

## Kuliah Biokimia ke-2

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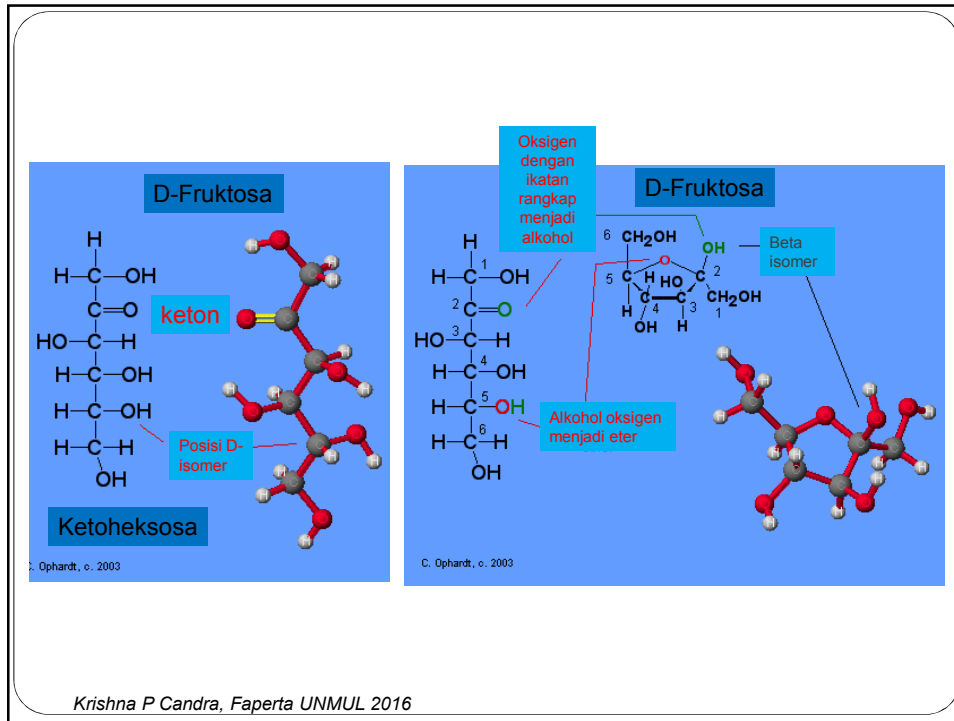
## KARBOHIDRAT

- Karbohidrat = karbon terhidrasi  $[C_n(H_2O)_n]$ 
  - Contoh:  $C_6H_{12}O_6$  = glukosa,  $C_5H_{10}O_5$  = ribosa,  $C_4H_8O_4$  = erithrosa,  $C_3H_6O_6$  = gliseraldehida
- Mempunyai gugus fungsional karbonil ( $C=O$ ) dan hidroksil ( $-OH$ ), sehingga dapat didefinisikan sebagai **polihidroksi aldehida** atau **polihidroksi keton**



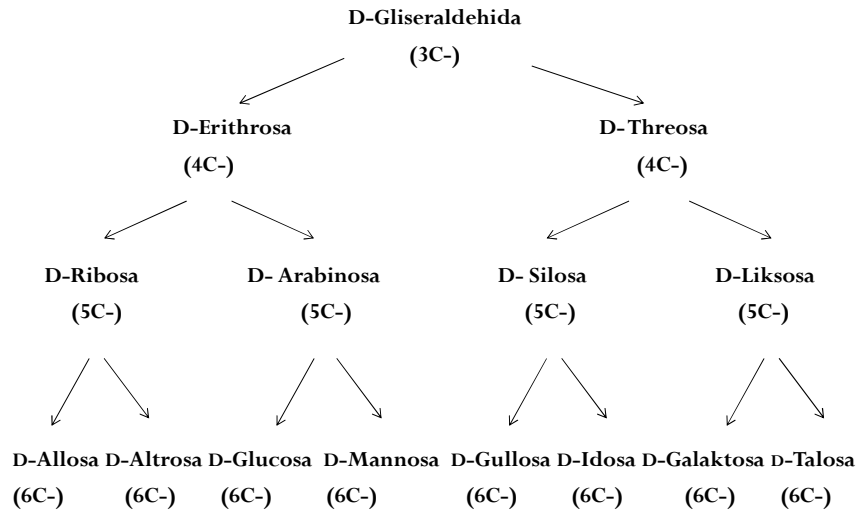
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<http://www.elmhurst.edu/~chm/vchembook/543glucose.html>



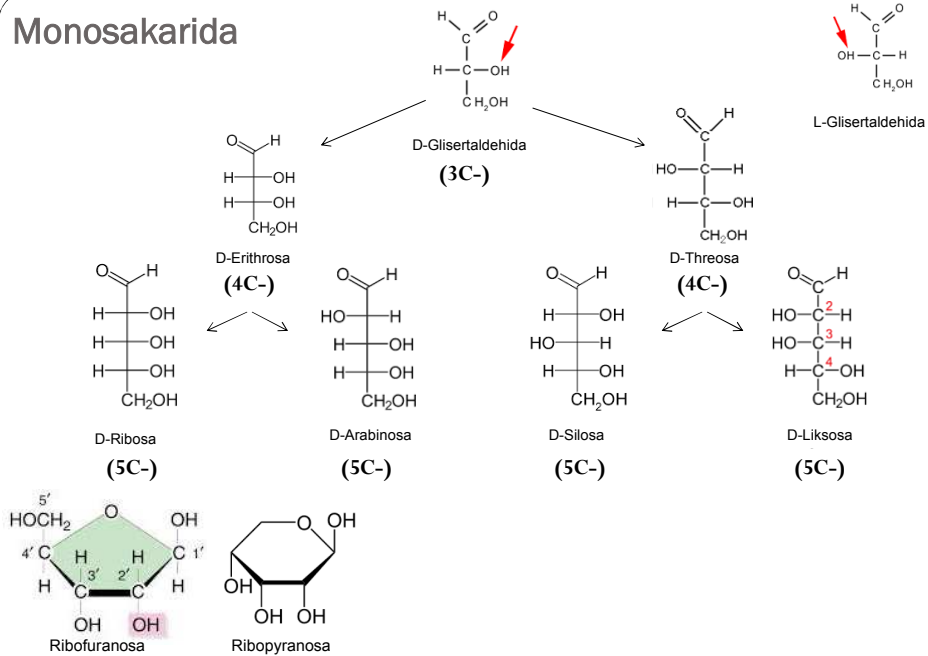
- ## KARBOHIDRAT (CHO)
- Fungsi CHO:
    - Sumber pangan/ energi
    - Materi Penyangga pada tanaman (serat) dan beberapa *crustacea*
  - Klasifikasi CHO:
    - Monosakarida (unit tunggal)
    - Oligosakarida (2-10 unit), untuk oligosakarida dengan 2 unit disebut disaccharides
    - Polisakarida (> 10 unit)
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# Monosakarida



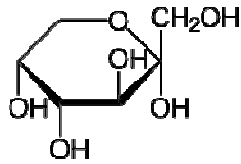
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# Monosakarida

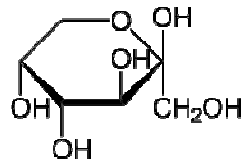


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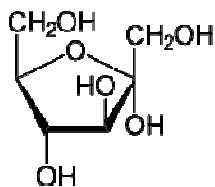
## Piranososa dan Furanosa



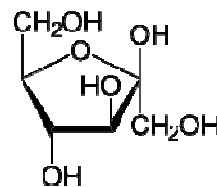
$\alpha$ -D-Fruktopiranososa



$\beta$ -D-Fruktopiranososa



$\alpha$ -D-Fruktofuranosa



$\beta$ -D-Fruktofuranosa

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## Di-, Oligo- dan Polisakarida 1503035053, Ricky Arif + 15

| Disakarida    | Komposisi Monosakarida | Ikatan Glikosida   |
|---------------|------------------------|--|
| Maltosa       | Glukosa                | 4-O- $\alpha$ -D-glukopiranosil-D-glukopiranosida (1,4- $\alpha$ ) |
| Sellobiosa    | Glukosa                | 4-O- $\beta$ -D-glukopiranosil-D-glukopiranosida (1,4- $\beta$ )   |
| Laktosa       | Glukosa, galaktosa     | 4-O- $\beta$ -galactopyranosyl-D-glucopyranoside (1,4- $\beta$ )   |
| Sukrosa       | Glukosa, fruktosa      | $\alpha$ -D-glucopyranosyl- $\beta$ -D-fructofuranoside            |
| Oligosakarida |                        |  |
| Dekstrin      | Glukosa                | 1,4- $\alpha$ (or 1,4- $\alpha$ and 1,6- $\beta$ )                 |
| Polisakarida  |                        |  |
| Pati          |                        |  |
| Amilosa       | Glukosa                | 1,4- $\alpha$  |
| Amilopektin   | Glukosa                | 1,4- $\alpha$ , 1,6- $\alpha$                                      |
| Glikogen      | Glukosa                | 1,4- $\alpha$ , 1,6- $\alpha$                                      |
| Sellulosa     | Glukosa                | 1,4- $\beta$   |

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# Maltosa

**Pembentukan maltosa (hidrolisis)**

+ Banyak H-OH

diastase enzyme

**Maltosa - Banyak unit**

C. Ophardt, o. 2003

<http://en.wikipedia.org/wiki/Maltose>

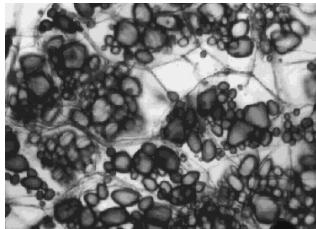
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# Dekstrin

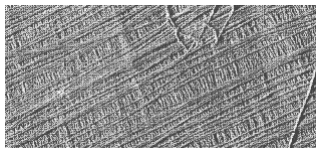
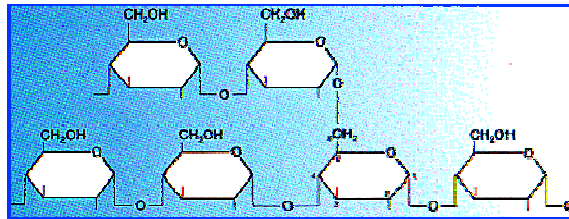
<http://en.wikipedia.org/wiki/Dextrin>

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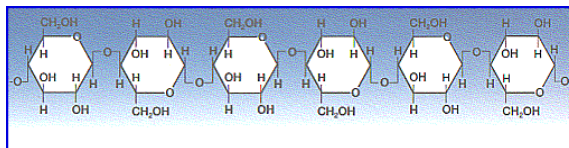
# Pati dan Sellulosa



**Pati (Starch)**



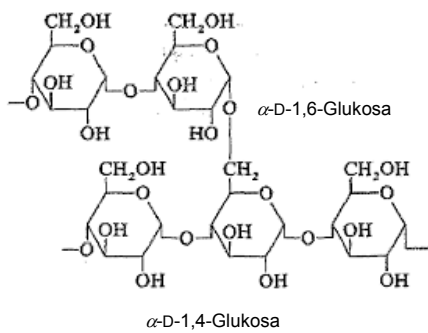
**Sellulosa**



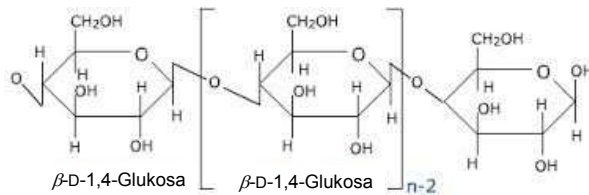
<http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/C/Carbohydrates.html>

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# Pati dan Sellulosa



**Pati**



**Sellulosa**

## Analysis Karbohidrat

- Perhitungan kandungan/kadar karbohidrat dilakukan dengan metode *by difference method* (berat/persentase bahan dikurang kadar protein, lipid, air, dan abu)
- Monosakarida and oligosakarida dapat dideteksi menggunakan teknik khromatografi
- Struktur karbohidrat (oligosakarida, glikoprotein, atau glikolipid ) dapat dianalisa dengan hidrolisis enzimatik yang dilanjutkan dengan analisis monosakarida menggunakan teknik khromatografi

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