

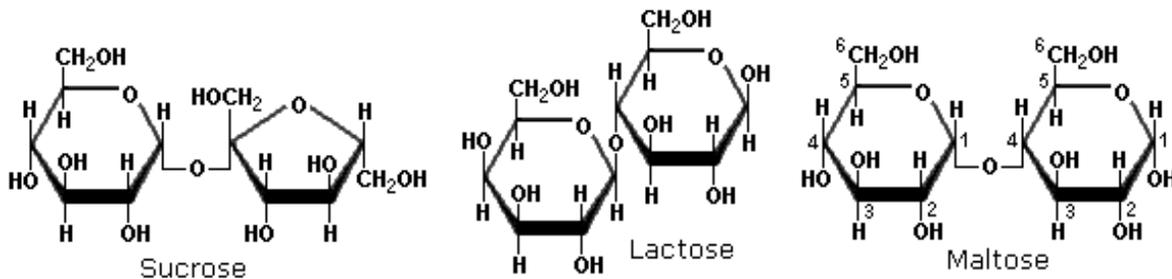
CARBOHYDRATES, PART 2: DISACCHARIDES AND POLYSACCHARIDES

Revised 6 June 2016

(fr. Curtis 5th, p 58-64), Campbell 6th: 62-68, 7th p 70-74, Sadava: 49-51, Campbell 9th 69-74, 10th: 69-72

Discuss monomer, dimer, polymer. Then monosaccharide, disaccharide, polysaccharides (p 69-71)

Disaccharide	component monosaccharides	linkages	sources
maltose	glucose-glucose	α 1,4	digestion of starch
sucrose	glucose-fructose	α 1,2	cane, beet sugar, maple syrup
lactose	galactose-glucose	β 1,4 (33% α in milk?)	milk sugar
trehalose	glucose-glucose	β 1,1	insect blood



Maltose first name because it is prime sugar in malt

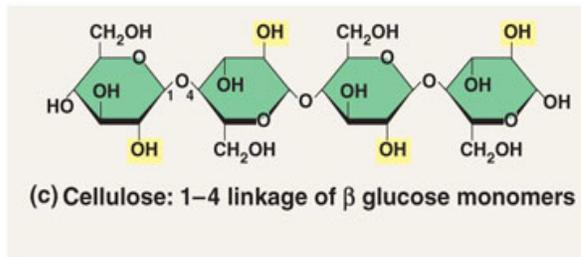
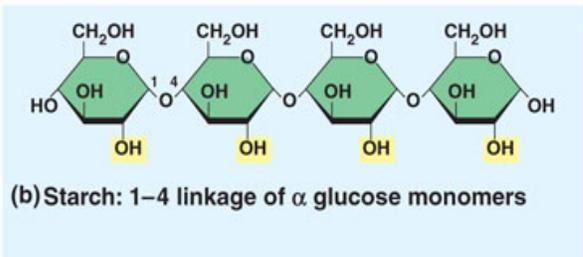
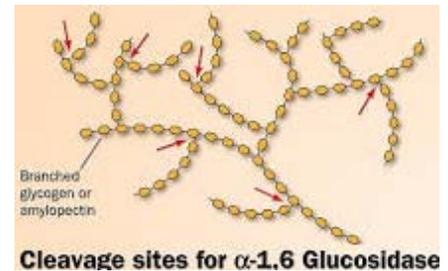
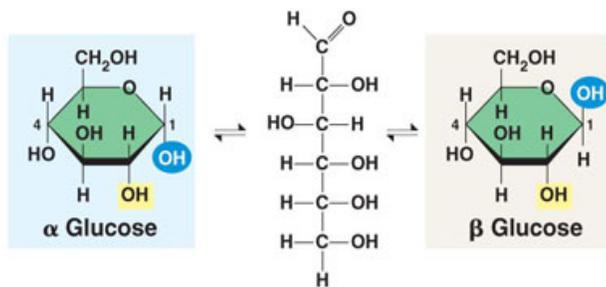
Making malt: Barley is sprouted: soaked, germinated, toasted, ground, extracted, then fermented for beer.

Song: *John Barleycorn Must Die* <https://www.youtube.com/watch?v=icyPFsIcAV0> or <http://www.omniscrit.com/2013/01/who-was-john-barleycorn-folk-song-and.html>

Raffinose: an oligosaccharide (gal-glu-fruc) found in beans. Humans cannot hydrolyze it, but bacteria ferment it: gas...

Starch in the mouth turns to maltose (Use unflavored white crackers to convert to sweet in a minute)

(a) α and β glucose ring structures



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POLYSACCHARIDES: Mostly poly-glucose compounds: (p 71 - 72)

starch	plant polysaccharide glucose storage molecule	glucose	α 1,4, α 1,6
glycogen	animal polysaccharide glucose storage (insulin causes)	glucose	α 1,4
cellulose	plant structural polysaccharide (roughage, bulk, fiber)	glucose	β 1,4
pectin	plant polysaccharide	rich in glucuronic acids	α 1,4 α 1,6
chitin	Arthropod exoskeleton and Fungi cell wall	N-acetylglucoseamine	β 1,4

JOHN BARLEYCORN MUST DIE:

Robert Burns

There was three kings into the east,
three kings both great and high,
and they hae sworn a solemn oath
John Barleycorn must die.

**They took a plough and plough'd him down,
put clods upon his head,
and they hae sworn a solemn oath
John Barleycorn was dead.**

**But the cheerful Spring came kindly on'
and show'rs began to fall.
John Barleycorn got up again,
and sore surprised them all.**

The sultry suns of Summer came,
and he grew thick and strong;
his head well arm'd wi' pointed spears,
that no one should him wrong.

The sober Autumn enter'd mild,
when he grew wan and pale;
his bendin' joints and drooping head
show'd he began to fail.

His colour sicken'd more and more,
and he faded into age;
and then his enemies began
to show their deadly rage.

**They took a weapon, long and sharp,
and cut him by the knee;
they ty'd him fast upon a cart,
like a rogue for forgerie.**

They laid him down upon his back,
and cudgell'd him full sore.
they hung him up before the storm,
and turn'd him o'er and o'er.

**They filled up a darksome pit
with water to the brim,
they heav'd in John Barleycorn.
There, let him sink or swim!**

**They laid him upon the floor,
to work him farther woe;
and still, as signs of life appear'd,
they toss'd him to and fro.**

**They wasted o'er a scorching flame
the marrow of his bones;
but a miller us'd him worst of all,
for he crush'd him between two stones.**

And they hae taen his very hero blood
and drank it round and round;
and still the more and more they drank,
their joy did more abound.

John Barleycorn was a hero bold,
of noble enterprise;
for if you do but taste his blood,
'twill make your courage rise.

'Twill make a man forget his woe;
'twill heighten all his joy;
'twill make the widow's heart to sing,
tho the tear were in her eye.

Then let us toast John Barleycorn,
each man a glass in hand;
and may his great posterity
ne'er fail in old Scotland!