2a) polypeptide + water 🡪 amino acid + amino acid …

4a) epsilon and zeta globin

b) gamma is expressed in the first 10 weeks while beta is not;

while gamma declines, beta increases;

gamma is not expressed at six months while beta is significant fraction of hemoglobin at six months;

both are expressed in approximately equal amounts at 24 days;

c) 10 weeks: hemoglobin is composed of equal amounts of alpha and gamma globin

6 months: hemoglobin is primarily composed of alpha and beta

globin with smaller amounts of delta globin

d) maternal blood

e) fetal blood and maternal blood will differ in affinity for oxygen;

fetal blood has a greater affinity so oxygen will move from mother to fetus;

change (with development) necessary so fetus can prepare for independent gas exchange/ transition from placental to pulmonary (lung) gas exchange

5 a) i wild: 13.3 kg

 ii captive: 16.2 kg

b) both groups lose most of their lipid;

captive birds lose more of their lipids than wild ones;

11.2 kg versus 9.6 kg / 93% vs 81 % (other figures comparing)

c) heat insulation / buoyancy / source of waste heat when metabolized

6 a) as quantity of water increases, percentage of grain protein decreases

b) optimal amount of water; above optimum level of water may get reduction in soil air; might reduce availability of soil nitrogen / prevent nitrogen fixation