1. Please translate the following paragraph into Chinese.

Random regression models were used to analyse the daily growth data for a total of 25 pigs of two commercial crossbred types between 75 and 140 days of age. A visual imaging system placed above a feeding station provided daily the plan area and length measurements of different body parts. Daily live-weight measurements of the pigs were obtained from a platform balance integrated into an electronic feeding station. Growth curves associated with different measures, pigs and types were compared. Significant differences in the age growth curves between the pig types could only be found in the ham width measurements (P < 0.05). The linear measure of ham width showed the greatest difference between the two types, and the lowest coefficient of variation among individual animals.

2. Please explain the meaning of the following article.

The gastrointestinal system is the primary site of entry for any orally administered compound, including dietary ingredients. The functions of this organ system include digestion, absorption, and protection, and the structure of the gut is well adapted to perform these functions. Several reviews have considered the relationship between structure and function in the avian gastrointestinal system. The mucosa of the gut is the first tissue to encounter dietary ingredients and contaminants, and studies of its macroscopic and microscopic structure have been to clarify the initial response of the animal to these materials. For example, it is well recognized that the presence of histamine and other biogenic amines in feeds can lead to macroscopic alterations in the gut, including ulceration and hemorrhage in the gizzard and intestine, proventricular ulceration is associated with the feeding of high levels of copper. It is abundantly clear that such severe structural changes have important effects on performance.

3. Please answer the following questions.

3-1. If the estimated breeding value of a quarter horse sire for time to run a quarter mile is -3 seconds (three seconds faster than average), and the estimated breeding value of a quarter horse dam is -1 seconds. Calculate the estimated breeding value for the offspring from this mating. If the population mean for quarter-mile time were 20 seconds, then what’s the population mean for the offspring?

3-2. Given the following alleles at the J locus: J, J’, j+, list all possible: a) homozygous combinations. b) heterozygous combinations.

3-3. Explain why an increase in each of the following speeds the rate of genetic change in a population: a) accuracy of selection, b) selection intensity, c) genetic variation.
4. Please describe metabolic roles of coenzyme NADPH.

5. 試評述下列名詞（請任選二題作答）。

5-1. avidin
5-2. cuticle
5-3. lytic activity
5-4. oiling

6. Two conditions, known as thaw rigor and cold shortening, have been recognized in recent years as resulting from low temperature in muscles before onset of rigor mortis. Thaw rigor is a severe type of rigor mortis that develops when muscle that was frozen pre rigor is thawed. Contraction produced by sudden release of Ca	extsuperscript{2+} into the sarcoplasm and may cause a physical shortening of 80% of original length of unrestrained muscles. However, a more common degree of thaw rigor shortening is approximately 60% of original length. Contraction is accompanied by release of large quantities of meat juices and severe toughening. Muscle need not be frozen for some undesirable attributes of thaw rigor to develop. Temperatures above 0 °C, but below 15-16 °C, if attained pre rigor, cause a type of contraction known as cold shortening. Although such shortening is less severe than that of thaw rigor, the underlying cause relates to release of Ca	extsuperscript{2+} or failure of the calcium pump of the sarcoplasmic reticulum.

Describe what ‘s differences between thaw rigor and cold shortening, please.