

ADVANCED SUBSIDIARY GCE
HUMAN BIOLOGY
Growth, Development and Disease

F222/ADVANCE NOTICE

Thursday 26 May 2011
Afternoon

For issue on or after:
13 MARCH 2011

Duration: 1 hour 45 minutes



INSTRUCTIONS TO EXAMINATION OFFICER/INVIGILATOR

Do not send this Insert for marking; it should be retained in the centre or destroyed.

NOTES FOR GUIDANCE (CANDIDATES)

- 1** This leaflet contains two case studies, which are needed in preparation for questions 1 and 2 in the externally assessed examination **F222**.
- 2** You will need to read the case studies carefully and also have covered the learning outcomes for Unit F222 (Growth, Development and Disease). The examination paper will contain questions on the two case studies. You will be expected to apply your knowledge and understanding of the work covered in F222 to answer these questions. There are 100 marks available on the paper.
- 3** You can seek advice from your teacher about the content of the case studies and you can discuss them with others in your class. You may also investigate the topics yourself using any resources available to you.
- 4** You will **not** be able to take your copy of the case studies, or other materials, into the examination. The examination paper will contain fresh copies of the two case studies as an insert.
- 5** You will not have time to read the case studies for the first time in the examination if you are to complete the examination paper within the specified time. However, you should refer to the case studies when answering the questions.

This document consists of **4** pages. Any blank pages are indicated.

Case Study 1

SOYA: GOOD OR BAD FOR YOU

Scientific studies conducted around the world have concluded that soy food (soya beans and many products derived from them) might either cause or prevent several health conditions.

Recently, the Harvard School of Public Health studied the diets of 99 men who had attended a fertility clinic with their partners, and provided a semen sample. The men were divided into four groups depending upon how much soy food they ate. The sperm counts were compared and the men eating the most soy food had a significantly lower sperm count than the men eating the least. Dr Jorge Chavarro, who led the study, said that chemicals called isoflavones present in the soy food, might be affecting sperm production.

On the positive side, scientists from the Vanderbilt University School of Medicine in Nashville, Tennessee, have studied the diets and health of 68 142 Asian women in Shanghai, aged 40 – 70. The scientists ranked the women on the basis of their soy food intake. They found that those in the top third of soy food intake had a 30% reduced risk of bowel cancer. The scientists concluded that the risk of bowel cancer decreased with increasing soy food intake, primarily among post-menopausal women.

Professor Mark Cline, from Wake Forest University Baptist Medical Centre, showed that soy foods could protect post-menopausal monkeys from developing cancer. Hormone replacement therapy induced a proliferation of cells in the breasts and wombs of these monkeys, but when they were fed soy food, the cells stopped multiplying so rapidly. Professor Cline reported, "These data indicate that soy supplements may decrease breast and endometrial (uterine) cell proliferation and therefore could decrease cancer risk in these tissues". He also said that further work was needed to explore the basic mechanisms by which chemicals in soy food may affect the incidence of breast cancer.

Soy foods are believed to have an impact on health because they contain a group of chemicals called isoflavones. The chemical structure of isoflavones is very similar to that of oestrogen (female sex hormone). As a result of this similarity in structure, isoflavones can interfere with the action of oestrogen. Depending on the type of oestrogen receptors present in cells, isoflavones may reduce or enhance the action of oestrogen. Isoflavones can compete with oestrogen for the same receptor sites, thereby decreasing the health risks of a high level of oestrogen. If during menopause, the body's natural level of oestrogen drops, isoflavones can compensate for this by binding to the same receptors, thereby easing menopausal symptoms.

Soy foods are a good source of protein, containing the eight essential amino acids, and a rich source of polyunsaturated fatty acids. Most human studies to date have involved Asian populations which traditionally eat far greater quantities of soy foods than the average person in the UK. Based on a survey of 2 000 adults, the mean population consumption of soy foods in the UK is about 3g per day. The Food Standards Agency believes that the consumption of soy food at this level is unlikely to have any health risks or benefits.

So, should we be eating more of it?

References:

1. <http://www.guardian.co.uk/science/2009/apr/11/bowel-cancer-soya/print>
2. <http://www.isoflavones.info>

All web references correct at the time of production.

Other references should be researched.

Case Study 2

MONITORING INFANT GROWTH

New UK-WHO Growth Charts for children from birth to 4 years of age are now available and have been used for all new births in England since May 2009. Kamini, an experienced paediatric nurse, is in discussion with Louise, a student nurse, about growth monitoring and the use of the new charts.

Louise:	Thanks for finding time to chat to me after the lecture.
Kamini:	It's no trouble Louise, I understand how important it is for you to feel confident in dealing with new mums. So..... what would you like to talk about?
Louise:	It's about the growth charts. What exactly are they and why do we use them?
Kamini:	Herehave a look at this (Kamini shows Louise the growth chart for 'Girl's weight 0–1 year'). The lines on the chart are called centile lines, and are based on the measurements of many children. They show the range of normal weights and heights, and how one child compares to another of the same age and sex. By plotting a child's growth on a chart, we can see if it is following the expected pattern. It also helps to identify a child that might have a problem that is affecting its development.
Louise:	I see and why did WHO think we needed new charts?
Kamini:	Well.... all previous growth charts were based on breast and bottle fed infants. Babies that are just breast fed show a different weight gain than the weight gain showed in the previous charts. At the same time it was noticed that healthy breast fed infants showed very similar growth patterns around the world. The WHO decided to produce charts, that could be used worldwide, that set breast feeding as the norm and described optimal rather than average growth.
Louise:	Is there an underlying reason why there are no centile lines between birth and 2 weeks?
Kamini:	Immediately after birth all babies show different patterns of weight gain and the charts can't allow for this – although previous charts incorrectly 'smoothed' out the line. What is important in the first two weeks is looking at weight gain relative to birth weight, not centile position.
Louise:	How then do we know if a baby's weight is OK in the first two weeks?
Kamini:	Weighing in the early days is important. Babies usually lose some weight to start with and then put it back on. This regain of weight helps to show that the baby is healthy and feeding is going well. If a baby has lost more than 10% of the birth weight, a Midwife or Health Visitor will probably check how the baby is feeding.
Louise:	Just one more..... how often should babies and infants be weighed?
Kamini:	After the early days, babies need to be weighed at the time of routine checks and injections.... that is around 2, 3, 4 and 13 months of age...as long as all is well. Many mothers like to have their babies weighed more often than this. This isn't always helpful and can cause unnecessary worry.
Louise:	Thank you Kamini.... this has been very helpful. I'll let you know how I get on at the baby clinic.

References:

1. Royal College of Paediatrics and Child Health
http://www.rcpch.ac.uk/Research/Growth_Charts_Education_Training_Resources
2. Growth Charts
<http://www.rcpch.ac.uk/Research/UK-WHO-Growth-Charts>

All web references correct at the time of production.

Other references should be researched.

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