

# Seksjon 1



## IMPORTANT INFORMATION

The **IBI 217- Nutrition and Physical Activity** exam consists of two parts;

**Part 1:** Consist of 4 general nutrition questions and has to be answered by all students.

**Part 2:** This part is divided between two fields of specialization: "*Specialization in nutrition and health*" and "*Specialization in sports nutrition*". You are to pick one of the specializations and answer all of the questions linked to that field. Follow the instructions given at the end of Part 1 and make sure you answer your desired questions.

Leave the specialization that you do not want to answer blank.

You cannot mix the specializations questions.

### 1 OPPGAVE

## Part 1- General Nutrition

### Question 1: Energy, energy availability and carbohydrates (10 p)

1. Which nutrients give us energy, how energy dense is each of them, and where will these nutrients be stored, or what is their metabolic destiny, when in surplus?
2. Describe and explain the concept «energy availability» (EA), what are the recommendations/ guidelines, and name at least 4 examples of consequences of low EA?
3. Why are we recommended to choose *complex* carbohydrates when consuming carbohydrates in a healthy diet.

## Part 1- General Nutrition

### Question 2: Vitamins, minerals and fluid balance (10 p)

1. How much of the total body volume is water? What is a typical sweat loss of fluid during training, and which factors will affect the loss of fluid in training?
2. What kind of effects on health and performance can be seen with dehydration during training?
3. Name one vitamin or mineral typically reported to be low in the Norwegian diet (according to official national reports), explain which complications that may be seen when deficient in this nutrient, and identify the most important sources of this nutrient in the diet.

## Part 1- General Nutrition

### Question 3: Proteins (10 p)

1. How do we decide protein quality in foods? Name three food sources with very high protein quality and three food sources with low protein quality!
2. What are the daily requirements for protein intake in the general population and for an elite endurance athlete training 15 hours per week? (Give the requirements in both absolute values and as values relative to the total energy intake)
3. Whey protein is a popular supplement for people who want to gain muscle mass. Describe the specific characteristics of whey protein which seems to be important for a positive effect on muscle protein balance!
4. Branched chain amino acids can in theory influence serotonin production in the central nervous system. Name the three branched chain amino acids and explain how supplementation with them in theory can affect serotonin levels in the brain! (Only explain the possible mechanism, do not discuss possible effects on fatigue!)

## Part 1- General Nutrition

### Question 4: Fat (10 p)

1. Which fatty acids are considered as essential fatty acids and why are they essential?
2. List the recommendations for fat intake through the diet!
3. Make a drawing explaining the process of fat digestion and the further distribution of fat to central and peripheral tissues after a meal. Make short comments to the drawing explaining the different steps and key players in the drawing!
4. Carnitine supplements are claimed to improve fat oxidation. Explain how carnitine supplementation in theory can influence fat oxidation and shortly discuss the evidence for beneficial effects of carnitine supplementation in athletes.

## IMPORTANT INFORMATION

The next part of the exam will consist of the two specializations offered in IBI217.

If you want to answer the Specialization in Nutrition and health part, you will answer the first two (2) questions and leave the last part of the exam.

If you want to answer the Specialization in Nutrition and Physical performance you will SKIP the first two questions and answer the four last questions.

## Specialization in “nutrition and health”

### Question 1: Cardiovascular, cancer and type 2 diabetes (20 p)

1. What would be your top 3 advices on lifestyle changes to reduce the risk of cardiovascular diseases? What are the biological mechanisms behind your advices (how does the advice reduce the CVD-risk)?
2. What recognizes the heart friendly Mediterranean diet? Describe the typical food-intake in contrast to the modern, Norwegian diet.
3. How can obesity affect the risk of cancer?
4. What would be your 3 most important advices on lifestyle/diet changes for a person with diabetes-2, and why do you emphasis these?

## 6 OPPGAVE

# Specialization in “nutrition and health”

### Question 2: Osteoporosis, and weight regulation (20 p)

1. How is vit-d (and its precursors) metabolized in the body, and how does vit-D regulate plasma-calcium concentration?
2. If you should give advice on 3 important lifestyle/diet factors to improve bone mineral content, which would those be? Why these; how do they work?
3. Discuss the advantage and/or the disadvantage of using protein supplements to increase energy intake to assist in weight gain.
4. Give some scientific related explanations on why results from weightreduction seems difficult, almost impossible, to maintain.

## 7 OPPGAVE

# Specialization in “Sports nutrition”

### Question 1: Energy intake in training and competitions (10 p)

1. What are the general recommendations for carbohydrate intake in athletes with different training volumes?
2. You are asked to compose an optimal sports drink for a cyclist who is going to compete in a 120 km race. What would your sports drink contain and how would the drinking strategy look like during the race?
3. You are responsible for the nutritional recovery plan for the players in an elite football club. What would you do the first 4 hours after a tough match to ensure optimal recovery till the next match played in three days?

## 8 OPPGAVE

# Specialization in “Sports nutrition”

### Question 2: Weight management (10 p)

1. Describe briefly an optimal strategy for a wrestler to lose 5 kg body mass in front of the world championship! (from 80 to 75 kg)
2. Describe briefly an optimal nutritional strategy for an alpine skier to gain 5 kg body mass in front of the next season! (from 95 to 100 kg, you have the time from May till October)

## 9 OPPGAVE

# Specialization in “Sports nutrition”

### Question 3: Ergogenic substances (10 p)

1. What are the physiological effects of ingesting bicarbonate the last hours before a competition and in which sports does this potentially improve performance?
2. What are the physiological effects of ingesting caffeine the last hours before a competition and in which sports does this potentially improve performance?

3. What are the physiological effects of supplementing your normal diet with creatine and in which sports does this potentially improve performance?

*Skriv ditt svar her...*

## Specialization in “Sports nutrition”

### **Question 4: Hydration (10 p)**

1. How can you evaluate athletes' hydration status? Describe briefly a strategy which ensures good hydration status before competitions!
2. How can you calculate the sweat rate during training and how can you use this information to optimize hydration during competitions?
3. Describe and optimal rehydration strategy after a 3 hour moderate-intensity workout in which your athlete lost 2 kg body mass.