Sports Nutrition for Young Basketball Players
CALAND YOUTH BASKETBALL PROGRAM
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Abstract

Caland Lyceum Amsterdam is concerned about the nutritional knowledge for their special talented basketball students. Therefore Brord Brugman, former board-member of the program and current trainer for the basketball players, asked help from the Inholland University of Applied Sciences - Bachelor of Sport Exercise & Health. This report contains the results of a developed intervention, used to improve the daily nutrition pattern and the sports nutrition knowledge of the special talented basketball students.

The intervention is to achieve the main goal: ‘Improve the individual daily nutrition pattern for twenty-two talented basketball athletes at the age of twelve till sixteen within twenty weeks, starting 5 February till 13 June 2013’.

During the intervention, twenty-one students participated this program. The intervention started at March 1, 2013 and ended at June 12, 2013, with four girls and seventeen boys. Within this target group, an intervention group of three girls and eight boys was selected to be provided with a personal nutrition advice. The client was concerned about these selected basketball players in particular, because they are overweight, underweight, very small, very big or special talented.

The intervention consists of several meetings. These meetings contain:
- Introduction to the intervention and examine the base knowledge of the target group
- Provide the target group with a general questionnaire and a food diary
- Give workshops in ‘Basic Nutrition’ and ‘Sports Nutrition’.
- Provide special intervention group with a personal nutrition advice
- Final evaluation and distribution of flyers on sports nutrition

After the intervention the results showed that the students gained more knowledge about healthy nutrition for basketball athletes in general and prior, during and after a game. Because of the lack of time we cannot answer the main question, how to: ‘Improve the individual daily nutrition pattern for twenty-one 12-16 year old basketball talented athletes within 20 weeks, starting February 5th and ending on June 19’. This because of the assessments with the food diary took too long to start a new one at the end. So there were no end term results about the nutrition diary. This could have been prevented to extend the intervention period, for example. However the interviews are telling us that they drink more water than they did before, at the expense of energy drinks.

It has been recommended to do the current intervention with the new talented athletes every year, so the intervention can keep improving considering the recommendations we gave the clients and the evaluation of this intervention. This can also benefit for the knowledge from the athletes.

As an end product a flyer was created to distribute amongst the current basketball players and the future basketball player who will attend the Caland Youth Basketball program.

The client was very satisfied about the intervention and the results. The target group found they had learned a lot and they enjoyed the meetings. The flyer was very helpful for the basketball players.
# Table of Contents

1 Introduction .......................................................................................................................... 9

2 Problem Analyses .................................................................................................................. 11
   2.1 Healthy Nutrition in general ................................................................................................. 11
      2.1.1 Basic nutrition in general ............................................................................................... 11
      2.1.2 Sports nutrition in general ............................................................................................. 12
   2.2 What is healthy nutrition for adolescents? .......................................................................... 12
      2.2.1 Food habits: why are regular eating patterns and snacks important? ....................... 13
   2.3 What is healthy nutrition for adolescents basketball athletes? ........................................... 14
      2.3.1 Fueling 12-16 year old basketball players ..................................................................... 14
   2.4 What is good nutrition before, during, after basketball ....................................................... 15
      2.4.1 Pre-game/practice meal ................................................................................................ 15
      2.4.2 During the Game .......................................................................................................... 16
      2.4.3 Post-Game Meal ........................................................................................................... 16
   2.5 Measurements ..................................................................................................................... 17
      2.5.1 Anthropometric measurements ..................................................................................... 17
      2.5.2 Food record diary measurement ................................................................................... 18
   2.6 Basketball and Energy expenditure ..................................................................................... 18
      2.6.1 Metabolic equivalent ..................................................................................................... 18
      2.6.2 Balance between supply and demand .......................................................................... 19
   2.8 Nature, severity and scale of the problem .......................................................................... 20
   2.9 Distribution of the problem ................................................................................................ 20
      2.9.1 Do adolescents eat healthy in general? .......................................................................... 20
      2.9.2 Is there a difference between athletes/ non-athletes? ................................................. 21
      2.9.3 Specific nutritional problems for basketball players .................................................. 21
   2.10 Problem perception by stakeholders ................................................................................. 22
   2.11 Conclusion ........................................................................................................................ 22

3 Determinants .......................................................................................................................... 23

4 Objectives ................................................................................................................................ 24
5 Target Group .................................................................................................................. 25
5.1 General and demographic characteristics of the target group ........................................ 25
5.2 Motivation and opportunities of the target group .......................................................... 27
5.3 Accessibility of the Target Group .................................................................................. 27

6 Intervention development ............................................................................................... 28
6.1 Previous Experience with Interventions ........................................................................ 28
6.2 Intervention Strategy and Timing .................................................................................. 28
6.3 Development of the Assessments ................................................................................. 29
6.4 Development of the Meetings ...................................................................................... 30
6.5 Intervention Schedule .................................................................................................. 31
6.6 Conclusion ................................................................................................................... 31

7 Implementation ............................................................................................................... 32
7.1 Choice of Implementation Strategy ............................................................................... 32
7.2 Introduction Presentation .............................................................................................. 32
7.3 Assessments ................................................................................................................ 32
7.4 ‘Basic Nutrition’ Workshop ......................................................................................... 34
7.5 ‘Sports Nutrition’ Workshop ....................................................................................... 34
7.6 Personal Nutrition Advice ............................................................................................ 35
7.7 Monitoring and generating feedback ............................................................................. 35
7.8 Incorporation in an existing structure ........................................................................... 35
7.7 Product - Flyer .............................................................................................................. 35
7.8 Conclusion ................................................................................................................... 36

8 Evaluation ........................................................................................................................ 37

9 Recommendations ........................................................................................................... 40

References .......................................................................................................................... 41
Attachments

A [General Questionnaire and Three-day Food Diary] .......................................................... 45
B [Body measurement references] ......................................................................................... 48
  B.1 [BMI for Children] ........................................................................................................... 48
  B.2 [Fat Percentage for Children] ......................................................................................... 50
C [PowerPoint Introduction Presentation] ................................................................................ 51
D [PowerPoint Workshop 'Basic Nutrition'] ........................................................................... 53
E [Subjects Workshop 'Sports Nutrition'] ................................................................................ 55
F [Flyer] ........................................................................................................................................ 56
G [Links to Videos Presentations] ............................................................................................. 56
H [Personal Nutrition Advices] ................................................................................................. 57
I [ASE Model] ............................................................................................................................. 66
1 Introduction

Nowadays more and more people seek a healthier lifestyle, and it is getting more important to alert people to the importance of nutrition in their lives. This is a worldwide issue and is carried out in different groups of society (World Health Organization, 2007). Basketball is a high intensity stop-and-go sport. To make sure the athletes can perform on a high level on all aspects, the right nutrition intake is crucial (Australian Institute of Sports, 2009). This counts especially for young basketball players, because adolescents can also have some problems in their general nutrition intake (World Health Organization, 2007).

This project arises when the client, Brord Brugman a former student and current coach/teacher in Caland Youth Basketball program, has the idea of asking for help to make their young players more healthy and strong for every practice and game. He thought it would be possible to make his young players healthier complementing all the training that they have with a balanced diet.

During this project there will be made an intervention with all basketball players from the Caland Youth Basketball program. Six of these athletes are selected based on their age (so they can understand English well enough) and the other four are ‘special cases’, recommended by the client, because of their morphology (small) and/or weight (overweight/underweight).

These basketball players are in a special talent program. A program is set up for young basketball players who want to pursue a professional basketball career. To do so, it is important try to implement all the PANSAS (Physical Activity, Nutrition, Smoking, Alcohol and Stress) aspects in their lifestyle now.

The main goal is: Improve the individual daily nutrition pattern for twenty-one 12-16 year old basketball talented athletes within 20 weeks, starting February 5th and ending on June 19.

To accomplish this, there are some sub-questions to answer:

- What is healthy nutrition and sport nutrition?
- What is healthy nutrition for adolescence?
- What is a balanced diet for talented basketball players between twelve and sixteen years old?
- What are the intake guidelines for talented basketball players between twelve and sixteen years old?
- What is the energy expenditure for talented basketball players between twelve and sixteen years old during exercise?
- What kind of nutrients do these athletes need to consume prior, during and post a game?
- Is nutrition counseling helpful for talented basketball players between twelve and sixteen years old?
- What kind of measurements are required for the intervention with these athletes?

The intervention will consist of two main groups. One group is the whole target group. In the second group, some basketball players from the whole target group are selected to be provided with a personal nutrition advice. The main goals and the sub-questions are set for both groups.

Structure of report

In chapter 2 there will be a desk research, i.e., all items that support the actions during the project. In chapter 3 can be seen all the information about the client and on all the intakes and assessments made. The chapter 4 deals with all the information about the intervention (individuals and group). The results obtained during the project will be discussed in chapter 5. In chapter 6 contains information about the evaluation and in the chapter 7 about the recommendations.
2 Problem Analyses

This paragraph explains the problem for the 12-16 year old basketball talents from the Caland Lyceum Amsterdam. The problem is how to reach the attention for these students to increase the knowledge about healthy nutrition relevant for basketball. Therefore a desk research has been made to answer what healthy nutrition for twelve to sixteen year old basketball athletes is and what they should consume before, during and after a game.

To answer our main question: ‘How to improve the individual daily nutrition pattern for twenty-two talented basketball athletes at the age of twelve till sixteen within twenty weeks, starting 5 February till 13 June 2013’, there has been made sub questions, these are:

- What is healthy nutrition and sport nutrition?
- What is healthy nutrition for adolescence?
- What is a balanced diet for talented basketball players between twelve and sixteen years old?
- What are the intake guidelines for talented basketball players between twelve and sixteen years old?
- What is the energy expenditure for talented basketball players between twelve and sixteen years old during exercise?
- What kind of nutrients do these athletes need to consume prior, during and post a game?
- Is nutrition counseling helpful for talented basketball players between twelve and sixteen years old?
- What kind of measurements are required for the intervention with these athletes?

2.1 HEALTHY NUTRITION IN GENERAL

This paragraph explain what basic nutrition and sports nutrition is in general, to provide basic information to the specific problem and target group.

2.1.1 Basic nutrition in general

When it comes to a healthy diet, balance is the key to getting it right. This means eating a wide variety of foods in the right proportions, and consuming the right amount of food and drink to achieve and maintain a healthy body weight. The eatwell plate applies to most people whether they're a healthy weight or overweight, whether they eat meat or are vegetarian, and no matter what their ethnic origin. The eatwell plate highlights the different types of food that make up the diet, and shows the proportions what individuals should eat to have a well-balanced and healthy diet. The eatwell plate consists of five food groups, see figure 2.1 (Oliver, 2013).

Figure 2.1 Eatwell plate (Oliver, 2013)
2.1.2 Sports nutrition in general
The impact of physical activity upon health and wellbeing is overwhelmingly positive at any stage of life. Adolescence is no exception to this and adolescents who are more active will be protected against overweight and obesity and will have enhanced skeletal growth. Often the diets of adolescents who are involved in sports are of higher quality than those of less active peers. However, where levels of physical activity become more intense over longer and more frequent periods, such as in adolescents who become involved in organized sports or dance activities, this can impact upon energy balance, nutritional status, growth, and development in an adverse manner (Langley-Evans, 2009).

Intense physical activity will, by definition, increase demands for energy and the sporting teenager will need to consume more energy sources than a sedentary individual, in order to maintain growth and sustain their performance. Requirements for protein may also be increased as physical activity will promote the deposition of muscle mass over and above that, which normally occurs in growth. High-level physical activity also increases demands for micronutrients. Demand for most vitamins follows energy intake and utilization. Mineral requirements will increase as calcium, iron, magnesium, sodium, phosphorus, and trace elements are incorporated into lean tissues and the skeleton as they grow under the influence of activity. Electrolyte and fluid status may also be perturbed by participation in sports. Where physical activity is at a level that does not exert consistently high nutritional demands, there is unlikely to be any adverse impact upon physiological processes. Energy deficit, poor nutritional status, and reduced body fatness are particularly associated with amenorrhea and menstrual cycle abnormalities in adolescent girls involved in intense sport. The worst-case scenario associated with high-level sport in adolescence has become known as the "female athlete triad" (Langley-Evans, 2009).

Conclusion
This information is relevant for the implementation plan for the twelve till sixteen year old basketball athletes, because this explains what healthy nutrition and sport nutrition is and why it’s important to consume healthy or sports nutrition. This paragraph answers the sub question 'What is healthy nutrition and sport nutrition?'

2.2 WHAT IS HEALTHY NUTRITION FOR ADOLESCENTS?
The nutritional requirements of young people are influenced primarily by the spurt of growth that occurs at puberty. The peak of growth is generally between 11 and 15 years for girls and 13 and 16 years for boys. The nutrient needs of individual teenagers differ greatly, and food intake can vary enormously from day to day, so that those with deficient or excessive intakes on one day may well compensate on the next. In this period of life, several nutrients are at greater deficiency risk including iron and calcium (Calvo, Galindo, & Aspres, 1992).

Iron
Among adolescents, iron-deficiency anaemia is one of the most common diet-related deficiency diseases. Adolescents are particularly susceptible to iron deficiency anaemia in view of their increased blood volume and muscle mass during growth and development. This raises the need of iron for building up haemoglobin, the red pigment in blood that carries oxygen, and for the related protein myoglobin, in muscle. The increase in lean body mass (LBM), composed mainly of muscle, is more important in adolescent boys than in girls. In preadolescent years, LBM is about the same for both sexes. Once adolescence starts, however, the boy undergoes a more rapid accumulation of LBM for each additional kilogram of body weight gained during growth, ending up with a final LBM maximum value double that of the girl. Other factors contributing to elevated iron needs are increased body weight and the beginning of menstruation for girls. All these factors should be taken into account when assessing iron needs in this group of age (James, 1991).
Iron diet
One of the most important diet considerations during adolescence is an increase in the intake of iron-rich foods such as lean meats and fish as well as beans, dark green vegetables, nuts and iron-fortified cereals and other grains. Iron from animal foods (known as haem iron) is much better absorbed than iron from non-animal sources (non-haem iron). Adolescents following vegetarian diets are therefore at an increased risk of iron-deficiency. However, vitamin C (e.g. from citrus fruits) and animal proteins (meat & fish) assist in the absorption of non-haem iron (Calvo, Galindo, & Aspres, 1992).

Calcium
The skeleton accounts for at least 99% of the body stores of calcium and the gain in skeletal weight is most rapid during the adolescent growth spurt. About 45% of the adult skeletal mass is formed during adolescence, although its growth continues well beyond the adolescent period and into the third decade. All the calcium for the growth of the skeleton must be derived from the diet. The largest gains are made in early adolescence, between about 10-14 years in girls and 12-16 years in boys. During peak adolescent growth, calcium retention is, on average, about 200mg/day in girls and 300 mg/day in boys. The efficiency of calcium absorption is only around 30% so it is important that the diet supplies an adequate calcium intake to help build the densest bones possible (Weaver, 2000).

Calcium diet
The achievement of peak bone mass during childhood and adolescence is crucial to reduce the risk of osteoporosis in later years. By eating several servings of dairy products, such as milk, yoghurt and cheese, the recommended calcium intake can be achieved. As well as a good dietary supply of calcium, other vitamins or minerals, like vitamin D and phosphorous, are needed for building up bones. Physical activity is also essential, particularly weight-bearing exercise, which provides the stimulus to build and retain bone in the body. Activities such as cycling, gymnastics, skating, ball games, dancing and supervised weight training for at least 30-60 minutes a day, three to five times a week can help build bone mass and density. Making the right dietary and lifestyle choices early in life will help young people develop health-promoting behaviors that they can follow throughout life (Weaver, 2000).

2.2.1 Food habits: why are regular eating patterns and snacks important?
Dietary habits, which affect food preferences, energy consumption and nutrient intakes, are generally developed in early childhood and particularly during adolescence. The home and school environments play a major role in determining a child’s attitude to, and consumption of individual foods. Teenagers, as well as being exposed to periodic food fads and slimming trends, tend to skip meals and develop irregular eating habits. One of the most frequently missed meals is breakfast. Studies show that breakfast plays an important role in providing needed energy and nutrients after an overnight fast and can aid in concentration and performance at school. Snacks generally form an integral part of meal patterns for both children and teenagers. Younger children cannot eat large quantities at one sitting and often get hungry long before the next regular mealtime. Mid-morning and mid-afternoon snacks can help to meet energy needs throughout the day. Fast-growing and active teenagers often have substantial energy and nutrition needs and the teaching of food and nutrition in the school curricula will enable children to have the knowledge to make informed choices about the foods in their regular meals and snacks (International Life Sciences Institute, 2000).
Conclusion
This information is relevant for the implementation plan for the twelve till sixteen year old basketball athletes, because this explains how much and why it is important to consume iron and calcium for these adolescents. This paragraph answers to the sub question ‘What is healthy nutrition for adolescence?’.

2.3 WHAT IS HEALTHY NUTRITION FOR ADOLESCENTS BASKETBALL ATHLETES?
It’s the same story for the basketball athletes, they also have to take iron and calcium into account. The only thing that is different is the need of fat, carbohydrates, protein and water, see paragraph 2.3.1 ‘Fueling 12-16 year old basketball players’.

The game of basketball requires the combination of endurance, speed, power, agility, specific basketball skills and mental acuity. By incorporating proper performance nutrition, players can maximize their training and competitive abilities. Athlete nutrition is a little different than nutrition for less active individuals. Basketball players and other athletes require more calories and carbohydrates than “average” individuals. This is because more energy is burned and more cell recovery is needed for a more physically active individual. Basketball players need to maintain their mental acuity to remember plays and “read” the game at all times. For this reason, a focus on brain foods, especially the omega 3 fatty acid DHA need to be a daily part of their dietary intake (Artemis, 2007).

2.3.1 Fueling 12-16 year old basketball players
Exceptional basketball players require a high-carbohydrate (CHO) diet to maintain stamina. Stored carbohydrates (muscle and liver glycogen) are the primary fuel for energy. For athletes, the American and Canadian Dietetics Associations recommend 55 to 58 percent of calories be CHO, 12 to 15 percent protein and 25 to 30 percent fat (Nutrition and athletic performance, 2000). The number of calories you need to eat will depend on your body size, intensity of training, cross training, and playing time. Male athletes who train for more than 90 minutes per day may need more than 23 calories per pound of body weight per day. Female athletes who train more than 90 minutes per day may need 20 to 23 calories per pound per day (Kraemer, 1997).

Be sure to get enough calories to meet the demands of basketball. Basketball has eight different changes in movement, and players average 997 changes in movement during a 48-minute game that equals a change every 2 seconds. Only 15% of playing time in a basketball game is of high intensity, but the high-intensity play is likely to determine whether you win or lose the game (Nutrition and athletic performance, 2000).

**Carbohydrate**  Basketball players need more than 2.7 grams of carbohydrate per pound of body weight per day (> 6 g/kg/day). During heavy training and competition, carbohydrate needs increase to 3.6 to 4.5 grams per pound of body weight per day (8 to 10 g/kg/day). Good sources of carbohydrate include whole grain breads and cereals, fruits, and vegetables (Peters, 1996).

**Protein**  Research suggests that protein should be 1.4-1.7 g/kg bodyweight (bodyweight in kg = bodyweight in pounds / 2.2 kg) per day (9) or as high as 2g/kg bodyweight per day in athletes (Tipton, 2004). The Recommended Daily Allowance of 0.8g/kg bodyweight per day protein is based on what is healthy for the average sedentary individual, which is not necessarily enough for athletes. Good sources of protein are fish, chicken, turkey, beef, low-fat milk, cheese, yogurt, eggs, nuts, and soy (Lemon, 2000).
Fat

Keep fat intake to 20 percent of your total calories, consisting primarily of essential and monounsaturated fats. Essential fatty acids are the type of fat that the body cannot create found in fish, flax seeds and walnuts. Monounsaturated fats, which are fats with one double bond, can come from olive or canola oils, seeds and/or avocados. For someone consuming 2,000 calories a day, the fat intake should be about 400 calories. This is equal to about 44 to 67 grams (each fat gram contains nine calories). Fat is used as fuel for endurance, but it also aids in neural recovery (Nutrition and athletic performance, 2000).

Water

Being dehydrated can lead to early fatigue. Dehydration is completely preventable. Basketball players should drink before, during, and after exercise and to drink before you feel thirsty (Williams, 2003).

Alcohol

The temptation of binge drinking may come more after a match for a celebration of victory, receiving a higher ranked belt or a gathering to ease the pain of defeat. A sensible amount will not hinder performance or health. In general, this means one drink for women and two for men. But alcohol intake can interfere with the game and post-exercise recovery. Get a post-exercise meal and fluids in first before drinking any alcohol. This way, less alcohol will have a tendency to be absorbed into the bloodstream and pass into the small intestine with the rest of the food. Avoid any alcohol 24 hours post-exercise if you have any soft tissue injuries or bruises. Alcohol and injuries are a bad combination, and it may actually increase swelling, bleeding and delay recovery (El-Sayed, 2002).

Conclusion

This information is relevant for the implementation plan for the twelve till sixteen year old basketball athletes, because this explains how much energy from each micronutrient these adolescents need, what could be beneficial for the performance of these athletes. This paragraph combined with what is healthy nutrition for 12-16 year olds answers the sub question ‘What are the intake guidelines for talented basketball players between twelve and sixteen years old?’.

2.4 WHAT IS GOOD NUTRITION BEFORE, DURING, AFTER BASKETBALL

This paragraph explains what to consume before, during and after a basketball game.

2.4.1 Pre-game/practice meal

The primary purpose of the pre-game meal is to offset fatigue during the game. There is no one-size-fits-all prescription because different people react differently to the same foods. Athletes should try to find food that won’t cause GI distress and will help to maintain focus and endurance (Nutrition and athletic performance, 2000).

Guidelines: (American Dietetic Association, 2006)

- Eat low-glycemic foods, such as whole grain cereals, certain fruits, sandwiches made with whole wheat bread, etc., approximately two to three hours before a competition. The closer to your match, the smaller the meal. This will help sustain blood-sugar levels.
- Keep protein and fat intakes low because they slow digestion.
- Avoid bulky foods, like raw fruits and vegetables, dry beans, peas and popcorn, which can stimulate bowel movements.
- Avoid gas-forming foods such as vegetables from the cabbage family and cooked dry beans.
- Drink 400 to 600 mL (14 to 22 oz) of fluid two to three hours before exercise depending on tolerance.
- Do not try new foods just before a match. Eat foods familiar with your digestive system.
- Some athletes prefer to use their favorite foods, which may give them a psychological edge.
2.4.2 During the Game
Although eating as directed above will allow you to top off glycogen stores coming into the event, you still have to contend with two potential enemies, these are dehydration and rapid glycogen utilization and depletion (Nutrition and athletic performance, 2000).

Dehydration
When games drag out longer than expected, you can lose a great deal of sweat, and become dehydrated. A player’s rate of fluid loss will depend on the environmental conditions, intensity of play, acclimatization, aerobic fitness, hydration status, age, and gender.

Guidelines: (American Dietetic Association, 2006)
- Two to three hours before practice, drink 2 to 3 cups of fluid.
- Thirty minutes before practice, drink ½ to 1 cup of fluid.
- During practice, drink about ½ to 1 cup at every break.
- During the game, drink about ½ to 1 cup of fluid at every timeout and during half-time.
- After practice or a game, drink about 3 cups for every pound the individual has lost. (Let the basketball player weigh themselves before and after practice or the game)
- Sport drinks can help to replace sodium lost in sweat. Sport drinks provide fluids, electrolytes, and carbohydrates, the isotonic sport drinks are always good.

2.4.3 Post-Game Meal
Consume 1.5 g/kg bodyweight of CHO-rich, low fiber foods and beverages within 30 minutes or as soon as possible after a game and again every two hours for four to six hours to replace glycogen stores. This may be difficult when traveling, but failing to do so will encourage under-recovery and potential muscle wasting (Williams, 2003).

Combination of CHO and protein has the added benefit of stimulating amino acid transport, protein synthesis and muscle tissue repair, all of which will further speed recovery and re-energize you for your next competition. It is better to consume the “meal” as a liquid in order to facilitate recovery faster, and follow with a variety of whole-foods between two and four hours later (Ivy, 2002).

Conclusion
This information is relevant for the implementation plan for the twelve till sixteen year old basketball athletes, because this explains what to consume before, during and after a game, to potentially perform better. This paragraph answers the sub question ‘What kind of nutrients do these athletes need to consume prior, during and post a game?’.
2.5 MEASUREMENTS
In this paragraph the different types of measurements are explained and which are used for the intervention group.

2.5.1 Anthropometric measurements
1. Body Mass Index (BMI)
The Body Mass Index, also known as BMI, is used to give an indication of whether a person is overweight. The BMI cannot be used as a reliable measure of obesity in an individual, since individual differences in physique not be taken into account (ratio of muscle, bone and fat) in the calculation. In clinical settings, despite the BMI uses them extensively. The BMI is useful and sufficiently reliable especially with larger deviations with underweight and overweight.

The BMI calculation is a formula that the Body Mass Index (BMI) is calculated. The BMI index is equal to your weight in kilograms divided by height in meters squared:

Formula:
BMI = kg / (height * height)
(Voedingscentrum, 2013)

2. Bio-impedance
Bio-impedance analysis (BIA) is a valuable tool for measuring the body composition the measurement of body fat in relation to lean body mass. It is an important part of any comprehensive health and nutrition assessment.

A normal balance of body fat to lean body mass is associated with good health and longevity. Excess fat in relation to lean body mass, a condition known as altered body composition, can greatly increase your risk of cardiovascular disease, diabetes, and more. BIA enables early detection of an improper balance in the client’s body composition, which allows for earlier intervention and prevention. BIA also provides the measurement of fluid and body mass that can be a critical assessment tool for the current health state of the client. BIA serves to measure your progress as you work to improve the client’s health.

Over 100 independent studies conducted over the past 20 years have demonstrated that BIA can provide an accurate and clinically useful assessment of body composition (Clinical Nutrition, 2004).

3. Medium-Hip Ratio (MHR)
The Medium-Hip-Ratio/Waist-to-Hip-Ratio (MHR / WHR) indicates if the amount of fat in the abdominal cavity is in relation to the fat around the hips. The total amount of fat in the body poses a health hazard, in which the fat is important. The MHR calculates the ratio of the waist circumference to the hip circumference.

There are several known methods of measurement, but a sequential measurement should be always performed by the same method:
- Waist circumference is measured mid basin edge and the lower rib cage.
- For waist circumference is the reference point below the last rib.
- For the hip circumference is the reference point just below the top of the iliac crista.
- For the waist circumference is the circumference of the abdomen is measured midway between the bottom of the rib cage and the top of the iliac crest.
- For the hip size is the size measured on the femoral condyles.
2.5.2 Food record diary measurement

Food records, or diaries, administered to subjects for completion in their own time are widely regarded as the most powerful tool for estimation of nutrient intakes. Subjects keep records for extended periods of time (usually 3–7 days) and note down all foods and beverages consumed at the time they are consumed. Food records have a number of strengths compared to other methods of estimating intake. Complex data on meal patterns and eating habits can be obtained through study of food diaries and this information can supplement estimates of nutrient intake. By obtaining records for periods of 5–7 days, the intakes of most micronutrients can be estimated with some degree of confidence, in addition to energy and macronutrients. For some nutrients, it is suggested that records of 14 or more days may be required the major disadvantage of the food record approach is the reliance upon the subject to complete the record fully and accurately. Maintaining a food record is burdensome and it is often noted that the degree of detail and hence accuracy will be greater in the first 2–3 days of a 7-day record compared to later days. The act of recording intake, especially if a weighed record is used, can change the eating behavior of subjects and hence lead to an underestimate of habitual intakes (Langley-Evans, 2009).

Conclusion

This information is relevant for the implementation plan for the twelve till sixteen year old basketball athletes, because this explains how the athletes could be measured. This paragraph answers the sub question ‘What kind of measurements are required for the intervention with these athletes?’.

2.6 BASKETBALL AND ENERGY EXPENDITURE

Basketball is a high intensity stop-and-go sport. Because of the high intensity (8 MET, see table 2.1) and environment they practice/play in, make the athletes need an accurate nutrition intake. The game of basketball has a combination of endurance, speed, power, agility, sport specific skill and mental focus. To make sure the athletes can perform on a high level on all aspects, the right nutrition intake is crucial (Common Nutrition issues in Basketball, 2009).

2.6.1 Metabolic equivalent

Metabolic Equivalent (MET) can tell you the amount of energy burned with just about any type of physical activity or exercise. Below are MET charts for sports or hobbies, see figure 2.2. There are also distinction between competitive, non-game and shooting on the baskets, see table 2.2.
1 MET is the energy burned at rest, which is 30-38 calories for every 30 minutes and 3-6 MET is the energy burned with moderate exercise: 90-225 calories per 30 minute workout. The exact calories burned during exercise may vary due to differences in muscle mass or level of effort during the activity. The charts compare the calories burned for 30 minutes of each activity (Why I Exercise, 2013).

Table 2.2 Exercise & calories during basketball (NutriStrategy, 2013)

<table>
<thead>
<tr>
<th>Exercise &amp; Calories Burned per Hour</th>
<th>130 lbs</th>
<th>155 lbs</th>
<th>180 lbs</th>
<th>205 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball game, competitive</td>
<td>472</td>
<td>563</td>
<td>654</td>
<td>745</td>
</tr>
<tr>
<td>Basketball, playing, non game</td>
<td>354</td>
<td>422</td>
<td>490</td>
<td>558</td>
</tr>
<tr>
<td>Basketball, shooting baskets</td>
<td>266</td>
<td>317</td>
<td>368</td>
<td>419</td>
</tr>
</tbody>
</table>

2.6.2 Balance between supply and demand
Balance is a term frequently used in nutrition. It is common to hear the phrase “a balanced diet”. It’s a diet that provides neither too much nor too little of the nutrients and other components of food that are required for normal functioning of the body. As shown in Figure 2.3, maintaining balance with respect to any given nutrient requires the supply of the nutrient to be equivalent to the overall demand for that nutrient (Langley-Evans, 2009).

Figure 2.3: Balance (Langley-Evans, 2009).

Overnutrition will generally arise because the supply of a nutrient is excessive relative to demand. Overnutrition will result in fat storage and obesity. Undernutrition arises when the supply of nutrient fails to meet demand. This can occur if intakes are poor, or if demands are increased (Langley-Evans, 2009).

Conclusion
This information is relevant for the implementation plan for the twelve till sixteen year old basketball athletes, because this explains how much energy the basketball athletes expend (Demand) and how much energy the basketball athletes need (supply). This paragraph answers the sub question ’What is the energy expenditure for talented basketball players between twelve and sixteen years old’ and ‘What is a balanced diet for talented basketball players between twelve and sixteen years old’.

2.7 NUTRITIONAL COUNSELLING
Proper nutrition and weight control practices can strongly influence basketball performance. This can be done by assessing changes in eating behaviors consequent to a nutrition education program of 1-hour nutrition education session plus 10 to 15 minutes of private, individual nutrition counseling. With afterwards a multiple-choice questionnaire assessment one month after the nutrition workshop. Positive outcomes after intervention for example were: Improvement of breakfast, fruits and vegetables intake and knowledge about the importance (Clark, 1998). Sports nutrition has grown over the past decade, linking how an athlete eats with how they perform during practice or competitive events (Clark, 1999). For this reason and given the results of this study, it would be beneficial to hire a nutritionist as part of the staff.
Coaches can help to enhance the performances of their athletes by promoting good nutrition. However, they need to have the nutritional knowledge in order to encourage healthy food choices. Providing athletes with a person knowledgeable in current dietary recommendations and aware of current eating disorders can perhaps prevent poor athletic performances and the potential problems with eating behaviors (Turner, 1995).

Nutritional knowledge is related to eating behavior (Burke, 1995). Research shows that athletes who receive nutrition education have significantly higher knowledge and attitude scores, and as their knowledge increases, they are more prone to eat or avoid certain foods. Lifetime consequences from poor food choices may affect bone health and reproductive health (Turner, 2001). Positive attitudes toward nutrition are linked with accurate nutrition knowledge (Witta et al., 1995). It is necessary to inform college athletes about even the basic dietary concepts.

One study (Mahsa, Maryam, Bahram, & Caryn, 2010) shows the evaluation of Iranian college athletes' sport nutrition knowledge. This study showed that the sport nutrition knowledge of these athletes is inadequate. Considering that this substandard level of knowledge may contribute to poor dietary behaviors, these athletes would benefit from nutrition-related training and education.

**Conclusion**

This information is relevant for the implementation plan for the twelve till sixteen year old basketball athletes, because this explains if nutritional counselling is a helpful tool to reach the main goal and how to implement counselling with the athletes. This paragraph answers the sub goal 'Is nutrition counseling helpful for talented basketball players between twelve and sixteen years old?'.
adolescents on marginal diets are the most vulnerable. Emotional stress is often associated with food faddism and slimming trends, both of which can lead to eating disorders such as anorexia nervosa.

On the other hand, the prevalence of overweight and obesity in children and adolescents is now a major nutritional problem and the condition is likely to persist into adulthood. Developing adolescents are particularly concerned about their body image and excessive weight can have profound effects on their emotional wellbeing as well as on their physical health. The cause of obesity is multifactorial and socio-economic, biochemical, genetic, and psychological factors all closely interact.

Lack of activity plays an important role in the development, progression and perpetuation of obesity in adolescence. Surveys of young people have found that the majority is largely inactive and health professionals and governments are now encouraging higher levels of physical activity among children and adolescents. Physical inactivity does not only have a prime role in the development of overweight and obesity, but also on the development of chronic diseases such as heart disease, certain cancers, diabetes, hypertension, bowel problems and osteoporosis in later life. In addition, physical activity is related to improvements in body flexibility, balance, physically active for at least 60 minutes daily (Freedman, Dietz, Srinivasan, & Berenson, 1999).

2.9.2 Is there a difference between athletes/ non-athletes?
Competitive athletes, sedentary individuals and people who exercise for health and fitness all need the same nutrients. However, because of the intensity of their sport or training program, some athletes have higher calorie and fluid requirements. Eating a variety of foods to meet increased calorie needs helps to ensure that the athlete’s diet contains appropriate amounts of carbohydrate, protein, vitamins and minerals (Nutrition and athletic performance, 2000).

2.9.3 Specific nutritional problems for basketball players

Practice/ game meals
The primary purpose of the pre-game meal is to offset fatigue during the game. There is no one-size-fits-all prescription because different people react differently to the same foods. Athletes should try to find food that won’t cause GI distress and will help to maintain focus and endurance (Nutrition and athletic performance, 2000). Although eating as directed above will allow you to top off glycogen stores coming into the event, you still have to contend with two potential enemies, these are dehydration and rapid glycogen utilization and depletion (Nutrition and athletic performance, 2000).

Dehydration
When games drag out longer than expected, you can lose a great deal of sweat, and become dehydrated. A player’s rate of fluid loss will depend on the environmental conditions, intensity of play, acclimatization, aerobic fitness, hydration status, age, and gender (Nutrition and athletic performance, 2000).

Glycogen Depletion
Glycogen depletion varies with the intensity of the game and aerobic fitness level. Although liquid carbohydrates can help restore lost glycogen, it is never replenished as fast as it is lost. To remedy both problems, bring a water bottle containing isotonic sport drinks. Still, something is better than nothing. It is important to consume carbohydrates in order to prevent performance decrease. For games longer than an hour, a carbohydrate-electrolyte drink, rather than water, is recommended (Peters, 1996).
2.10 PROBLEM PERCEPTION BY STAKEHOLDERS
This problem arises when the client, Brord Brugman a former student and current coach/teacher in Caland Youth Basketball (CJB) program, has the idea of asking for help to make their young players more healthy and strong for every practice and game. He thought it would be possible to make his young players healthier complementing all the training that they have with a balanced diet.

It was his idea to let the basketball players of the CJB program get familiar with general nutrition guidelines and to translate this into a sports diet. According to Brord, all basketball players are healthy. Some of them need some extra attention, because they are tending to be overweight or underweight. His goals is to let the basketball players gain information about sports nutrition, so they can perform better on the court.

2.11 CONCLUSION
The desk research is relevant for the implementation development for the twelve till sixteen year old basketball athletes, because this explains what healthy nutrition and sport nutrition is and why it’s important to consume healthy or sports nutrition. The research explains also why it is important to consume iron and calcium and how much the athletes should consume. The research tells how much energy from each micronutrients the athletes need, because this could be beneficial to perform better. It also explains what the athletes have to consume before, during and after a game and how the athletes could be measured. There has also been a research on how much energy the basketball athletes expand and how much energy the basketball athletes need to stick with the nutritional balance and it shows if nutritional counselling is a helpful tool to reach the main goal and how to implement counselling with the athletes.

This all gives enough information to answer our main question: ‘How to improve the individual daily nutrition pattern for twenty-two talented basketball athletes at the age of twelve till sixteen within twenty weeks, starting 5 February till 13 June 2013’
3 Determinants

The ASE model (attachment I) is based on the theory of planned behavior and is focusing on the explanation of behavior. This model proposes that behavior is explained with the intention to show that behavior en that the intention is explained by three main determinants;

- **Attitude** How positive is someone regarding to the new behavior?
- **Social influence** How positive is their direct environment regarding to the new behavior?
- **Self-efficacy** Can someone implement the new behavior?

(Vries, Dijkstra, & Kuhlman, 1988)

Figure 5.1: ASE model (Vries, Dijkstra, & Kuhlman, 1988)

This model, in combination with PREFFI, is used to explain the behavior of the international exchange students. The problem of why these young basketball players don’t eat the appropriate sport nutrition can be explained due to a lot of different factors.

The social influence on this age, twelve to sixteen year olds, is huge. They rebellion against authority, but the arguments decrease with increasing age. The influence of their friends is big (Langley-Evans, 2009). A positive factor of working with a target group of this age, is that they still live at home, so the support of their parents can help them a lot. That’s why it is important to meet with the parents of these young basketball players as well.

This target group are motivated to become better basketball players. That’s why they signed up for the special basketball program of the Caland Lyceum. If the intervention is developed, regarding their motivation to become a better basketball player, the change of success could be higher. It can also be hard to motivate them, because they will not feel the difference right away. It is necessary to explain it is a long term behavior change and not a microwave success story.

These basketball players have a busy schedule. Most of them practice two times a day and have two games in the weekends. This could be a problem, considering the timing of the intake of the foods. Some athletes practice early in the morning or during ‘dinner time’. It is possible the target group doesn’t have enough knowledge to put together the right amounts and sorts of food. It is possible the young basketball player don’t find the time to implement the new behavior in their daily live, because of their busy schedule.
4 Objectives

The intervention is to achieve the main goal:

‘Improve the individual daily nutrition pattern for twenty-one talented basketball athletes at the age of twelve till sixteen within twenty weeks, starting February till June 12th 2013.’

To answer our main question: How to improve the individual daily nutrition pattern for twenty-one talented basketball athletes at the age of twelve till sixteen within twenty weeks there has been made these sub questions:

- What is healthy nutrition and sport nutrition?
- What is healthy nutrition for adolescence?
- What is a balanced diet for talented basketball players between twelve and sixteen years old?
- What are the intake guidelines for talented basketball players between twelve and sixteen years old?
- What is the energy expenditure for talented basketball players between twelve and sixteen years old during exercise?
- What kind of nutrients do these athletes need to consume prior, during and post a game?
- Is nutrition counseling helpful for talented basketball players between twelve and sixteen years old?
- What kind of measurements are required for the intervention with these athletes?

These questions are answered in the research (chapter 2) and the final conclusions on these questions can be found in chapter 2.11.

Objectives for the researchers

The objective for the researches is to develop a nutrition intervention, based on recent literature, for young basketball players, that creates a long term effect on their nutrition habits. These long term effects cannot be measured, so we will measure at the beginning end at the end of the intervention period.

Objectives for the client

The client, Brord Brugman, has the objective to provide nutrition knowledge for his basketball players, so they can use this in their current and future basketball careers. Also, he wants to provide some specific advices to certain basketball players from the program, to help them with their body composition and personal nutrition habits. As a product, Brord wants to provide the current and future basketball players from the program with a flyer. On this flyer, there need to be information about sports nutrition for basketball players.

Objectives per meeting

- The introduction meeting should be designed to introduce the target group to the intervention and establish the nutrition knowledge of the target group.
- The main goal for the basic nutrition workshop is to provide information about basic nutrition guidelines.
- The goal of the sports nutrition workshop was to retrieve the knowledge of the students with the information that was given them in the introduction and the first workshop.
- The final meeting should contain an evaluation to check if we have met the goals and objectives set at the beginning of the intervention.

All these objectives should be met in the intervention period, starting February 5th and ending June 12th, 2013. How these objectives are being measured, is explained in chapter 6, the intervention development.
5 Target Group

5.1 GENERAL AND DEMOGRAPHIC CHARACTERISTICS OF THE TARGET GROUP

The twenty-two basketball players (four girls, seventeen boys), born between 1997 and 2000, which the goals are made for, are in a special talent program at Caland Lyceum. This program is set up for young basketball players who want to pursue a professional basketball career. The client is the Caland Basketball program. Brord Brugman, former board-member of the program and current trainer for the basketball players, will guide us through the intervention.

The target group consists of twenty-one adolescents. These twenty-one basketball players are all basketball players in the special Caland Basketball Program at the Caland Lyceum. There are more boys than girls: seventeen boys and 4 girls (see figure 5.1).

Figure 5.1 Boys and girls target group

Eleven of these basketball players are chosen by Brord for an individual intervention. Six of these athletes are selected based on their age (so they can understand English well enough) and the other four are ‘special cases’, recommended by the client, because of their morphology (small) and/or weight (overweight/underweight). One boy is really tiny for his age. One boy and one girl are very tall and a bit too heavy. One boy is very tall and really skinny. The selection is made by Brord Brugman, their trainer. He knows the basketball players better than us, so he knew who needs an individual intervention and who can handle the level of English. Brord made this choice because he’s concerned about the weight, lifestyle or growth. The intervention group consists of three girls and eight boys. Brord also wants to know what the group knows about healthy nutrition and improve their intake for potential better performance, this is for the whole group.

The target group consists of twenty-one adolescents. The high rates of growth during adolescence (12-18) carry significant increments in nutritional requirements over and above those seen in earlier childhood. Indeed, this stage of life has requirements for energy and nutrients that are greater than seen in adulthood, both in absolute terms and when expressed per body weight. It is recognized that adolescence increases nutrient requirements, mostly due to growth. The remodeling of body shape, body composition, and the maturation of organ systems also contribute to adolescence being a peak time in terms of nutrient requirements. Adolescents are frequently identified as being at risk of under nutrition, largely because their very high nutrient demands often appear incompatible with their range of preferred foods and patterns of eating (Langley-Evans, 2009).
Table 5.1: Characteristics of the Target Group

<table>
<thead>
<tr>
<th>Size target group</th>
<th>The target group consists of twenty-one athletes. The intervention group consists of eleven of those twenty-one athletes.</th>
</tr>
</thead>
</table>
| Age               | These athletes are born between 1997 and 2000.  
|                   | Born in 2000: Six (one girl, five boys)  
|                   | Born in 1999: Seven (one girls, six boys)  
|                   | Born in 1998: Six (one girl, five boys)  
|                   | Born in 1997: Two (one girl, one boy)  |
| Sex               | There are four girls and seventeen boys on the target group. On the intervention group there are three girls and eight boys.  |
| Socio-economic status | The socio-economic status within the target group is very different. The school where the program is located is a school with mostly children with low socio-economic status. In the target group there are also children with a high social-economic status.  |
| Ethnic/ cultural background | The backgrounds of the target group is very different. There are mostly Dutch student, but also some Turkish, Moroccan and Indonesian.  |
| Geographic location | The school is located in the western part of Amsterdam. All athletes from the target group live in or around Amsterdam.  |
| Language spoken and read | Everybody from the target group speaks Dutch. Most of them speak English and all of them understand English. The older athletes (born in 1997 and 1998) can speak English fluently.  |
5.2 MOTIVATION AND OPPORTUNITIES OF THE TARGET GROUP

Through some research has been found the best way to build and realize a questionnaire (Attachment A) to review this on the target group (Langley-Evans, 2009). After the questionnaire is done, it was sent by mail to our contact (Brord Brugman) and he gave it to the children to fill out everything.

Food records, or diaries, administered to subjects for completion in their own time are widely regarded as the most powerful tool for estimation of nutrient intakes. Subjects keep records for extended periods of time (usually 3–7 days) and note down all foods and beverages consumed at the time they are consumed (Langley-Evans, 2009)

To have a general idea of the nutritional intake of children, they were asked to complete a three days food diary (a practice day, a game day and a non-practice day). This food diary was delivered together with the general questionnaire, so they would only have one form to fill out.

When you define methods for the assessment of nutritional status, must choose those which best detect the nutritional deficiencies to be corrected, also considering the costs for their use, the personal skill level required to apply them properly, the time needed to perform them, the receptivity of the population studied and the possible health risks.

To make the body measurements we will use anthropometric methods, such as:

- BMI (length, weight and age)
- Body fat percentage with a bio-impedance meter
- Waist-hip rate

Anthropometric methods make indirect measurements of the nutritional status of individuals and groups of individuals, as they are designed to estimate the composition of the body (Langley-Evans, 2009). These methods were chosen after the desk research.

These basketball players are in a special talent program. This program is set up for young basketball players who want to pursue a professional basketball career. They have a lot of motivation because all want to achieve their main goal. They are still young, so there is a big possibility for everyone to become a professional of high competition.

To have a starting point and know the level of knowledge of all youth basketball players (this is one of the sub-goals), was made a questionnaire, a general nutrition questionnaire. This questionnaire contains some general questions about their nutrition and also about their work-out, school schedule and habits. All this questions are insert in the ASE model (scoring 1-5) (Vries, Dijkstra, & Kuhlman, 1988)

Through some research has been found the best way to build and realize this questionnaire (Langley-Evans, 2009). After the questionnaire done, it was sent by mail to our contact (Brord Brugman) and he gave to the children to fill out everything.

5.3 ACCESSIBILITY OF THE TARGET GROUP

The target group can be reached through their trainer, Bord Brugman. Brord is accessible to us with his phone number, work e-mail address and personal e-mail address. He will communicate with the target group face-to-face, because he sees them every day. Also, the e-mail addresses of the target group are made available, but Brord told us they won’t reply that much through e-mail. Some students asked some questions through texting, so they are accessible through their phone number as well. If needed, Brord can provide all the phone numbers.
6 Intervention development

6.1 PREVIOUS EXPERIENCE WITH INTERVENTIONS
This is the first time this target group has dealt with this kind of intervention. Also, it is the first time this project group has developed such an intervention. There is little experience with this kind of intervention from both sides. All three project member has developed an intervention for an individual client before, but not for a group. Also, these interventions for de individual clients were not specific for nutrition, not specific for basketball players and not specific for children between twelve and sixteen years old.
The methods that were described in the Problem Analysis (chapter 2) are proven to be effective methods (such as a food diary and body measurements).

6.2 INTERVENTION STRATEGY AND TIMING
The intervention is to achieve the main goal:
‘Improve the individual daily nutrition pattern for twenty-two talented basketball athletes at the age of twelve till sixteen within twenty weeks, starting February till June 12th 2013’.

These students have a busy schedule. They go to school every day and most of them have basketball four to seven times per week. It is not preferable to give them a lot of extra work each week, because that would interfere with their schoolwork and basketball practices and games. We will try to plan a meeting with them every other week, so we will see them frequently, without putting a burden on their shoulders.

For accomplishing the main goal and the sub-questions, there are certain steps to take.
First, it is necessary to inventory their current knowledge about nutrition. The best way to achieve this, is to have a discussion and a presentation about this subject. In the presentation, there should be included an active work method to make it interesting and fun for the athletes.
Second, it is important to have an overview of the current nutrition pattern of the athletes. Without knowing what their nutrition habits are right now, it is impossible to give them a correct advice. Also, for giving a correct nutrition advice, it is necessary to know about the individual morphology and body composition. Therefore, we will measure their BMI, body fat percentage and waist-hip rate. Anthropometric methods make indirect measurements of the nutritional status of individuals and groups of individuals, as they are designed to estimate the composition of the body (Langley-Evans, 2009). For the BMI we will measure their height and weight to calculate the kg/m². For the fat percentage we will use a bio-impedance meter, because it is quick and an easy way to get an estimation of the fat percentage.

Food records, or diaries, administered to subjects for completion in their own time are widely regarded as the most powerful tool for estimation of nutrient intakes. Subjects keep records for extended periods of time (usually 3–7 days) and note down all foods and beverages consumed at the time they are consumed (Langley-Evans, 2009).
To have a general idea of the nutritional intake of children, they will complete a three days food diary (a practice day, a game day and a non-practice day). This food diary was delivered together with a general questionnaire, so they would only have one form to fill out.
The questionnaire will give us an indication of what the students know about their own nutrition, how they see themselves and what their motivation is like. The questionnaire and the food diary is found in Attachment A. The justification of the food diary and the questionnaire is found in chapter 6.4.
The timing of the intervention could have been better. During the intervention, the athletes will be done with their basketball season or will be at the end of their basketball season. Preferably, the intervention could be timed during the off-season, so they can practice with the new nutrition behavior. When they are fully used to it, the athletes can implement their new nutrition habits during the whole (new) season.

6.3 DEVELOPMENT OF THE ASSESSMENTS

The assessments that will be used are mainly to assess the knowledge of the target group, to establish their current nutrition pattern, to examine their motivation and social influences and to establish their body composition. To do this, the athletes will fill in a questionnaire and a food diary and we will do some body measurements.

For the general questionnaire, we will use a lot of questions, based on the ASE-model (see Attachment 1). The questionnaire is put in attachment A. The first part of the questionnaire should be to gain basic information about the clients (name, age, height, weight, gender, birth date). In the next part, the clients should fill in their weekly schedule, containing practices, schools, work and other time-consuming things. That way, when the advice was written for the individual clients, the timing in the nutrition pattern can be taken into account as well.

In the next part, some questions were asked about their general health (PANSAS criteria). Young basketball players should not be smoking or drinking (a lot of) alcohol each week, neither do drugs. If they filled in they do, they could be confronted with it. Also, if they do and don’t write it down, they would think about it. Also, some questions about sleeping pattern was asked. This is one of the PANSAS criteria. The question about recently losing or gaining weight, could give us some information we can use in the individual advice, taken together with the body measurements and the food diary. If it doesn’t give us information right away, it could give us a subject to talk about during a talk about the nutrition advice.

To gain some information about their knowledge level of nutrition, the question ‘To your opinion, what is a healthy meal?’ was asked.

The next questions were all formulated using the ASE-model (chapter 5.2). This will give us information about their attitude, social influences and self-efficacy concerning this intervention.

The athletes were asked to fill in a food diary of three days (a practice day, a non-practice day and a game day). Although these young basketball players have a different schedule each day and a very busy one, it is not preferable to let them fill in a food diary for a whole week. Studies (Langley-Evans, 2009) has shown that completing a three day food diary is the most efficient.

With this information, a specific advice can be written for the individual clients.

Anthropometric methods make indirect measurements of the nutritional status of individuals and groups of individuals, as they are designed to estimate the composition of the body (Langley-Evans, 2009). Two body measurements (beginning and end) are used to compare with each other. It is a way of formulating if the goals were met.

Due to research (see chapter 2), the following measurement methods were chosen:
- Height and weight (BMI)
- Fat percentage using a bio-impedance meter
- Waist- and hip circumference (waist/hip ratio)
6.4 DEVELOPMENT OF THE MEETINGS

The main goal for the workshops is to improve their knowledge about nutrition and sports nutrition, to activate a change in nutrition habits, so they can benefit from this in their basketball careers. The workshops will consist of providing them with information and using an active work form to let them participate in the learning process. This will enhance the chance of them learning and remembering the information we provide them. They will listen to us, ask questions, participate in work forms and evaluate the information and form of presentation. The evaluation will be done by asking them questions at the end of the meeting. These questions will consist of questions to make sure the information got through to them, to make sure the form fits the target group and to evaluate the actual execution.

Introduction meeting
The introduction meeting should be designed to introduce the target group to the intervention and establish the nutrition knowledge of the target group. This information can be used to develop the workshops. During the introduction meeting we will introduce ourselves and the study. We will explain the international part of it and why we chose them as a target group. Another important goal for this meeting should be to activate their motivation and motivation to work on this intervention. Their cooperation is needed to make this intervention a success.

Basic Nutrition workshop
The main goal for this workshop is to provide information about basic nutrition guidelines. In the introduction presentation there was a quick estimation of the students’ knowledge about nutrition. This information was used to put the right information in this workshop. Also, it was taken into account that they will have another workshop shortly after, about sport nutrition.

Sports Nutrition workshop
The goal of this workshop was to retrieve the knowledge of the students with the information that was given them in the introduction and the first workshop. This workshop should be fun and active, to trigger them to speak up. This workshop was given in the gym, without a PowerPoint. This was chosen, because the students would feel more at ease in this setting, since it is one of the places where they spend most of their time.

Final evaluation
This meeting should contain an evaluation to check if we have met the goals and objectives set at the beginning of the intervention. To get a specific idea on what they learned and remembered, we will ask personal and open ended questions to each individual. This way they are triggered to provide us with useful and personal answers and evaluations.
6.5 INTERVENTION SCHEDULE

We are going to work with all twenty-one athletes from the target group on improving their knowledge about important nutrition keys for basketball players. We will provide information during workshops about basic nutrition from intake to expenditure and about what to eat before, during and after practices/games. At the end of the project, we will provide them hardcopy information so they can reflect on what they have learned. Also, this can be used for new athletes at the program. At the end of a period of 20 weeks, starting February 5th and ending on June 19, the athletes will have more knowledge to improve their daily nutrition pattern.

Table 6.1: Schedule for the target group

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
<th>What</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>March 1</td>
<td>Introduction to the project</td>
</tr>
<tr>
<td>2</td>
<td>March 29</td>
<td>General Questionnaire and Food Diary</td>
</tr>
<tr>
<td>3</td>
<td>April 12</td>
<td>Measurements</td>
</tr>
<tr>
<td>4</td>
<td>May 22</td>
<td>‘Basic Nutrition’ workshop</td>
</tr>
<tr>
<td>5</td>
<td>May 27</td>
<td>‘What to consume before, during and after practices and games’ workshop</td>
</tr>
<tr>
<td>6</td>
<td>June 6</td>
<td>Measurements</td>
</tr>
<tr>
<td>7</td>
<td>June 12</td>
<td>Final Evaluation and distribute flyers on sports nutrition</td>
</tr>
</tbody>
</table>

Within the target group, there is a special intervention group. They will get individual guidance about their nutrition needs and habits. In table 6.2 the schedule for this intervention group is presented. In table 6.2 the schedule for the whole target group is presented.

We will also interview them, ask them to fill in a three-day food diary and meet with their parents to see if they are interested in help at home with their meals and to give permission so that we can work with them.

Table 6.2: Schedule for the intervention group

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
<th>What</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>March 1</td>
<td>Introduction to nutrition and the project</td>
</tr>
<tr>
<td>2</td>
<td>March 15</td>
<td>Set up the project and meeting with parents</td>
</tr>
<tr>
<td>3</td>
<td>March 29</td>
<td>General Questionnaire and Food Diary</td>
</tr>
<tr>
<td>4</td>
<td>April 12</td>
<td>Measurements</td>
</tr>
<tr>
<td>5</td>
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</tr>
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<td>‘What to consume before, during and after practices and games’ workshop</td>
</tr>
<tr>
<td>7</td>
<td>June 6</td>
<td>Measurements</td>
</tr>
<tr>
<td>8</td>
<td>June 12</td>
<td>Personal advice to intervention group</td>
</tr>
<tr>
<td>9</td>
<td>June 12</td>
<td>Final evaluation and distribute flyers on sports nutrition</td>
</tr>
</tbody>
</table>

The difference between the intervention group and the whole target group is we will check the personal nutritional habits of the intervention group. We will do this through a general questionnaire and food diary. With this extra information, we will provide them with a personal advice to improve their nutrition habits.

6.6 CONCLUSION

It is important to stay close to the students on knowledge level and interpretation level. These children didn’t choose to do the nutrition program, so it is necessary to keep it quick, fun and informative. The schedule was developed with this in mind and that also counts for the decision to do these specific body measurements. Also on the general questionnaire and food diary this was taken into account. The measurements were quick and effective. Also the questionnaire and the food diary were spread out quick and handed in before the deadline.
7 Implementation

The methods developed in the intervention development were used to create an intervention for the basketball players. The schedule from table 6.1 and 6.2 were used as strict guidelines. In this chapter the exact outcome of the intervention development can be read. This implementation created with the advices from Brord Brugman, our fellow students on the International Nutrition minor, the supervisor of the project and within this project group.

7.1 CHOICE OF IMPLEMENTATION STRATEGY

For this implementation we used a top-down approach. This is a reasoned, outcomes-based approach to work with these clients specifically and not on a general basis. This way, the target group has a change to adapt within the intervention to make sure it fits their needs. At the beginning of the intervention, it will be made clear what the objectives are and what the thread of the intervention is. We will explain to them we need their cooperation and the cooperation of their parents, because they are minors.

The meeting will mostly be held in the school classrooms during school hours. Because they are in a special sports program, it is possible for them to change their schedule to attend these meeting. Of course, it is better for all of them to not change their schedule too much, only if needed. Because there is a big differential within the target group, the intervention is developed to maintain the needs of the large group. There is room to complement the meetings the meet the special needs of certain individuals.

7.2 INTRODUCTION PRESENTATION

The first meeting was performed with all the athletes with who we will work. Initially we started with a short presentation, our names and why we were there. Then we explained what we would do with them during the next weeks. But always trying to show how important is their nutrition to achieve better results in competitions and games. We ended the presentation with a few questions so we can get a general idea of the group’s knowledge about nutrition. This presentation can be found in Attachment C.

At the end met with the group of eleven students, the group with which we have a bigger intervention, explained a bit more detail what we would do with them and ask for them to talk with their parents for at least one of them to be present at the next meeting.

The second meeting was held only with the intervention group and their parents. The presentation was the same as in the first meeting, started with a brief presentation about who and why is there and what will be made with their children. At the end was given an informed consent to everyone, to allow accomplish some of the things planned for them, because all athletes are minors.

7.3 ASSESSMENTS

The assessments of the general questionnaire and the food diary from the intervention group and the body measurements of the whole target group are important for the development of the workshops and the personal nutrition advice. Also, it is necessary to use these assessments to evaluate the effect of the intervention at the end. In this chapter the implementation of the assessments will be explained.

General questionnaire and food diary

All 11 students from the intervention group filled in the general questionnaire (attachment A). In this chapter the common things in the answers are discussed.
Most athletes have two or three afternoon practices at their basketball club, two or three morning practices at the school and one or two games in the weekends. This means the athletes practice four to six times a week and have one or two games in the weekends.

Almost every athlete give their selves a six or higher on the question “How healthy do you think you are?”. One athlete thinks he is a four on this question.

On the ASE questions, they all scored well. One girl from the individuals scored herself high (a four) on the “daily stress level” question. She also scored herself a one on the question “How important do you think it is to change your current nutrition habits to sports nutrition?” One boy from the individuals thinks he is not able to organize his nutrition habits to sports nutrition. He scored a one on this question. One boy scored a three on whether his friends are encouraging him to eat unhealthy. He also thinks it is going to be hard to change, because he scored a four on that question. On all the other ASE questions he scored a three.

For every student of the intervention there was an advice formulated based on the questionnaire and the three day food diary (attachment A). There was also a comparison made with the body measurements (table 3.1), so the advice would be specific to that person. The timing of the foods and the practices and games was also taken into account.

For the reference of the body measurements the references in Attachment B were used.

The food diaries were filled in very differently. Some students filled it in correctly and it seemed they took the time to do it. Other students only filled in two or three things per day. To make sure the information is correct, we will discuss this during the personal interview.

**Body measurements**

The measurements were taken during a morning practice at the gym. Not every athlete was available for measurement during that time. Seventeen out of twenty-one athletes were measured. Because the measurements were taken during a basketball practice, most of the athletes were feeling warm and were sweating. This could have influenced the bio-impedance meter. Therefore, these results are an estimation.

<table>
<thead>
<tr>
<th>Name</th>
<th>Height</th>
<th>Weight</th>
<th>BMI</th>
<th>Fat%</th>
<th>Waist</th>
<th>Hip</th>
<th>Ratio</th>
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<td>69 kg</td>
<td>19.1 kg/m²</td>
<td>19.8%</td>
<td>69 cm</td>
<td>83 cm</td>
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<tr>
<td>2. Raoul</td>
<td>176 cm</td>
<td>72.5 kg</td>
<td>23.4 kg/m²</td>
<td>13.3%</td>
<td>72.5 cm</td>
<td>77 cm</td>
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<td>3. Lisanne</td>
<td>178 cm</td>
<td>68 kg</td>
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<td>28%</td>
<td>71 cm</td>
<td>88.5 cm</td>
<td>0.80</td>
</tr>
<tr>
<td>4. Yaron</td>
<td>193.5 cm</td>
<td>75.1 kg</td>
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<td>5.7%</td>
<td>73.5 cm</td>
<td>79 cm</td>
<td>0.93</td>
</tr>
<tr>
<td>5. Lawrence</td>
<td>184.5 cm</td>
<td>62.7 kg</td>
<td>18.4 kg/m²</td>
<td>9.3%</td>
<td>73 cm</td>
<td>79 cm</td>
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<tr>
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<td>14.3%</td>
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<td>7. Gis</td>
<td>180 cm</td>
<td>58 kg</td>
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<td>8. Dajo</td>
<td>174 cm</td>
<td>51 kg</td>
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<td>8.9%</td>
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<td>9. Cas</td>
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<tr>
<td>10. Pien</td>
<td>178 cm</td>
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<td>22.9 kg/m²</td>
<td>25.1%</td>
<td>71 cm</td>
<td>76 cm</td>
<td>0.93</td>
</tr>
<tr>
<td>11. Keyshawn</td>
<td>155 cm</td>
<td>37.5 kg</td>
<td>15.7 kg/m²</td>
<td>8.7%</td>
<td>57 cm</td>
<td>63 cm</td>
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</tr>
<tr>
<td>Britt</td>
<td>174 cm</td>
<td>57.5 kg</td>
<td>19 kg/m²</td>
<td>18.7%</td>
<td>67 cm</td>
<td>80 cm</td>
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<tr>
<td>Jaisy</td>
<td>183 cm</td>
<td>57 kg</td>
<td>17 kg/m²</td>
<td>4%</td>
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<td>76 cm</td>
<td>0.88</td>
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<tr>
<td>Idir</td>
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<td>53.9 kg</td>
<td>19.1 kg/m²</td>
<td>6.7%</td>
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<td>Joost O.</td>
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<td>70 cm</td>
<td>0.96</td>
</tr>
<tr>
<td>Jovino</td>
<td>169.5 cm</td>
<td>51 kg</td>
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<td>6.3%</td>
<td>63 cm</td>
<td>68 cm</td>
<td>0.93</td>
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</table>
7.4 ‘BASIC NUTRITION’ WORKSHOP

The main goal for this workshop was to provide information about basic nutrition guidelines. In the introduction presentation there was a quick estimation of the students’ knowledge about nutrition. This information was used to put the right information in this workshop. Also, it was taken into account that they will have another workshop the next week, about sport nutrition. You can find the presentation in attachment D.

Before starting to provide them with information only, the goal was to trigger the minds of the students. They were given ten question to start the workshop. Each group had an answer sheet, which laid his response and at the same time added a score in their response depending on their confidence in the answer (1 to 3). These questions were open-ended questions, so they would discuss the answer within their small group (three/four people). During their discussion, we will walk around the room to help get them in the right direction. After the ten questions, the answers were not given. They should pay attention to the presentation, because the answers will be provided in the information in the presentation. During the presentation, the students are constantly being asked for feedback, to involve them in the presentation. At the end of the presentation, we would discuss the answers to the ten questions real quick.

After the presentation, we reinforce the idea of having a careful and healthy nutrition. We also asked them to think, at home, on what they thought would be a good meal before and after practice / game.

The students were discussing within the group a lot. They were asking questions to each other and to us. During the presentation, when they found the information that gave the answer to a question, they would discuss that with us as well. Also some other questions were asked during the presentation, when someone wanted to know more about that certain subject or when something wasn’t clear yet. The goals of the workshop were achieved.

7.5 ‘SPORTS NUTRITION’ WORKSHOP

The goal of this workshop was to retrieve the knowledge of the students with the information that was given them in the introduction and the first workshop. This workshop should be fun and active, to trigger them to speak up.

This workshop was given in the gym, without a PowerPoint. This was chosen, because the students would feel more at ease in this setting, since it is one of the places where they spend most of their time.

We started off with the group sitting in a half circle, facing the fall. They were divided into four teams. Each team had their own color of post-its. We would give them subjects. They would write keywords on the post-its regarding the subjects and put them on the wall. After each subject we would discuss why they put these certain keywords on the wall.

After five subjects, we would start a game. The same teams would have a different color pylon. On the floor in the gym there were put 65 pieces of paper with numbers from one to 65. All teams would start at ‘start’. Per team, they would throw tow dices and advance that much eyes on the dices. At every even number (two, four, six, eight, etc.) they would get an open-ended questions to discuss in the team. When given the answer, the other teams were asked on their opinions. In attachment E the subjects can be found.

On each number with a nine (9, 19, 29, 39, etc.) there was put a jail. When the advanced to that number, they would have to do an assignment, as push-ups, sit-ups, star jumps, burpees, etc. First team to reach 65 would win.

After the game, we all together held a little reflection about what is sports nutrition.
For this workshop, it was a little chaotic during the game. Some groups took a long time to formulate their answers, making the other teams wait a longer time. For team who didn’t reach that many even numbers, it was a little less exciting too. After all, the goal of this workshop was achieved.

7.6 PERSONAL NUTRITION ADVICE
In the research (chapter 2) we stated the nutrition guidelines for children of the same age as the target group, for basketball players and for adolescent basketball player specifically. With this information and the determinants from chapter 3, we searched for some areas of improvement in the food diaries.

Most athletes had the same general problems. These are mentioned in the first part of the advice. This advice is based on the answers of the questionnaire and food diary. The advice is formulated in quick and easy pointers, so the athletes can follow them more easily. There is no one-size-fits-all prescription because different people react differently to the same foods. Athletes should try to find food that won’t cause GI distress and will help to maintain focus and endurance.

In chapter H you can find the specific personal advices, based on the food diaries, general questionnaire and research, for the eleven individuals.

7.7 MONITORING AND GENERATING FEEDBACK
After each meeting, we would schedule a couple of minutes to evaluate the meeting with the target group. At the beginning of each meeting, we would let the target group summarize the previous meeting. This way, we can conclude that we are on the right track or that we need adjustments along the way. Also, after the group has left, we would stay and ask Brord for feedback and evaluate all together. Most feedback was positive and showed us we were on the right track. Feedback after the basic nutrition workshop we got from the target group, showed us we should include more active work forms in the next meeting, to keep their attention. The overview of this feedback is put in chapter 8.

7.8 INCORPORATION IN AN EXISTING STRUCTURE
These students are used to a certain setting in their school and basketball program. In the intervention, we used the same setting. The meetings were held at the end of their school day, during the same class hours they have with their regular classes. The time schedule was provided by Brord, so we could fit our meetings in there.

The target group have not yet been in an intervention before, but at the same time as this sports nutrition intervention, they had an intervention about preventing sports injuries. We did not have contact with the other project group. Next time, we should tune these two interventions together, to have a balanced intervention period for the target group.

7.7 PRODUCT - FLYER
To create a flyer, that the Caland Youth Basketball Program can use each year, was a request of our client, Brord Brugman. He wanted a flyer about specific sports nutrition facts for his young basketball players. This flyer can be found in attachment F. The flyer is made with a lot of color and pictures, to catch the students’ eyes.

On the front side of the flyer, some general information was put about sports nutrition for young basketball players. It tells you something about the importance of sports nutrition. It is written to trigger the readers to implement sport nutrition into their eating habits.
On the back side of the flyer, some general guidelines are put, on do’s and don’ts about sports nutrition. Some easy to follow points were put into three different categories: before practice/games, after practice/games and hydration. In our desk research and through the
intervention development and implementation, we found that these subject were the most important to give information about. It is formulated into pointers and not into pieces of text, so it is easy to read and easy to follow up on for the students.

The information for the flyer is put together using the information we found in the research, during the intervention period, in the general questionnaire and in the food diaries. The flyer is designed to fit most of the individuals of the target group, as nutrition advice usually is very specific and personal. The flyer should be seen as guidelines for most adolescents playing basketball at a high level.

7.8 CONCLUSION

Upon completion of our intervention was possible to draw in some conclusions; some positive and some negative.

Due to lack of time was not possible to carry out a final questionnaire in order to check the various changes in dietary patterns in the young athletes, from the beginning to the end of the intervention.

With all the feedback received by our client and the young players was possible to realize that our main goal was successfully achieved. During twenty weeks and during various meetings we had with the young players, it was possible to verify that their knowledge about nutrition suffered a great evolution in general. We note that, through a few questions we ask at the beginning and end of each meeting; in beginning to remember what he had been treated at the previous meeting and in the end to test if they were mindful throughout the meeting.

We also we conclude that a target group with a large variety of ages is not good, because what is quite easy to understand for a teenager of 17 years is not for a 13 year old. In a next intervention, it would be good to take into account the age in order to be able to share and make things more interesting for both older as for younger.

When we make the schedule for the various meetings for the development of the intervention, we should have put more meetings to do in order to facilitate the intervention for young players. Making less meetings has made our job much more difficult, because we had to find ways to make presentations engaging and interactive for young players. With more meetings would have been possible to divide the information, making it easier for students to retain all the information transmitted.
8 Evaluation

To improve the implementation, lectures and workshops the clients (Brord and the athletes) made a promise to evaluate every meeting. How we implemented these evaluation, is described in chapter 7.7. All of the evaluations and provided feedback is given verbally right before and after the meetings. Below in table 8.1 you can find every evaluation from every meeting. The name of the person or group who provided this feedback is put after each statement. There is also an attachment with the videos from the meetings, see attachment G.

Table 8.1 Evaluation

<table>
<thead>
<tr>
<th>Date</th>
<th>What?</th>
<th>Evaluation</th>
</tr>
</thead>
</table>
| March 1 | Introduction to the project        | The introduction was good because and easy to follow for the 12-16 year old athletes *(Target group).*  
  The presentation was clear planned so the students know what to expect *(Brord Brugman).*  
  ‘Become a better basketball player’, should be changed; ‘Become a healthier player or potential perform  
  better’ *(Peter van Noord).* |
| March 15| Set up the project and meeting with parents | Almost the same PowerPoint as for the introduction, but this time for the parents, make the font size a little bigger for the parents *(Brord Brugman).*  
  Tell the parents what you are going to explain before starting the PowerPoint *(Brord Brugman).*  
  It’s always more difficult to present for the parents, but the presenting was good and clear *(Brord Brugman).* |
| March 29| General Questionnaire and Food Diary | Easy to fill in for the students and a good explanation about the food diary *(Target group).*                      |
| April 12| Measurements                       | Don’t measure after a practice game, because this can influence the outcomes *(Brord Brugman).*                        |
| May 22  | ‘Basic Nutrition’ workshop         | The workshop was good, but as u can see the students were out of energy after 30 minutes of talking. Make the workshop more practical next time *(Brord Brugman).*  
  Let the perky athletes sit in front so they will pay attention *(Brord Brugman).* |
| May 27  | ‘What to consume before, during and after practices and games’ workshop | Good practical workshop about Nutrition for basketball athletes *(Brord Brugman).*  
  Fun game *(‘Ganzenbord’)* and good that you have made four teams *(Target group and Brord Brugman)* |
| June 6  | Measurements                       | No feedback or evaluation                                                                                                               |
| June 12 | Personal advice to intervention group | The personal advice was good, especially because you talked in private with the individuals. Girls appreciate this more often, because they rather don’t want to share their weight with others *(Brord Brugman).* |

1 Peter van Noord is an ex-international basketball player, who sometimes assists Brord on practices
June 12  |  Final evaluation and distribute flyers on sports nutrition

The flyer was really nice and you can print 50 more flyers for the new potential basketball athletes (Brord Brugman).

The clients were really thankful and they give us a present, a box full of healthy food! Such as Red Bull, butter cake, white chocolate, Mars etc. This was of course a joke from the clients but delicious though (Target group).

Process
The plan was to let the target group fill in a second food diary, to measure if a change have been measured after the workshops and personal advice on their nutrition pattern. This second food diary have never been implemented.

All the basketball players who have been selected were successfully reached. There were no drop-outs during the intervention. Also, the group was representative, because the intervention was mandatory for every single basketball player in the program.

The project was very educative to do because it was the first time to implement nutritional counseling, this brought some challenges, because it was also on a semi-professional level with a specific sport (basketball).

Gladly our client Brord was very helpful for giving us feedback every meeting and recorded every meeting so we could check out how we did. It was also easy to communicate with Brord and to make appointments.

The students were very interested about nutrition, but after 30 minutes they started to pay less attention. But they are high school students so this was not a problem, we kept the theoretical things before the 30 minute mark and after the 30 minute mark we did a competitive practical game.

One of the conditions for success of the intervention was the actual implementation. A lot of energy, motivation and knowledge was provided during the meetings. The active work forms caused the target group to participate and gain more knowledge about sports nutrition by doing this.

Effect
After the last meeting we knew that we could not asses with a feed record diary to check if the nutrition pattern has been improved. So we asked the athletes if they already made some changes in nutrition. Almost everyone answered that they drink more water and less energy drink (red bull). The assessments after every meeting showed that the students paid attention and gained more knowledge.

Has a change been measured?
The main goal was how to ‘Improve the individual daily nutrition pattern for twenty-one 12-16 year old basketball talented athletes within 20 weeks, starting February 5th and ending on June 19’.

Every meeting we had a practical part were the students answered questions about what we just told them. Most of them had correct answers and we tried to let every individual share his/her opinion. But the food diary’s we gave them in meeting three was handed in completed at meeting six, so there was a lack of time to do another food diary at the start.
We have no end term results about the nutrition diary, so we could not say if the nutrition pattern is better than it was before, but what we can see is that because of the practical assessments every meeting they gained more knowledge about healthy nutrition, specifically for basketball athletes.

After the two workshops were given, the same measurements were taken to search for any differences. In table 8.2 you can find these results. When put into SPSS², there was no significant difference found. Probable causes for this could be a couple of things, as:

- Measurements to close to each other
- Intervention not specific enough
- Intervention period to short
- Measurements not made accurate enough
- Waist-hip ratio is not accurate enough for children, because they are still growing

<table>
<thead>
<tr>
<th>Name</th>
<th>Height</th>
<th>Weight</th>
<th>BMI</th>
<th>Fat%</th>
<th>Waist</th>
<th>Hip</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>Ella</td>
<td>191 cm</td>
<td>68.6 kg</td>
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<td>20.2%</td>
<td>68 cm</td>
<td>83 cm</td>
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<td>Raoul</td>
<td>176 cm</td>
<td>70.5 kg</td>
<td>23.4 kg/m²</td>
<td>13.8%</td>
<td>70.5 cm</td>
<td>78 cm</td>
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</tr>
<tr>
<td>Lisanne</td>
<td>178 cm</td>
<td>69 kg</td>
<td>21.5 kg/m²</td>
<td>26.9%</td>
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<td>Yaron</td>
<td>193.5 cm</td>
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<td>79 cm</td>
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<td>Daio</td>
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<td>65 cm</td>
<td>71 cm</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Was the change caused by the intervention?
Because of our workshops we showed the athletes now know why it is important to consume healthy nutrition for athletes and why to drink more water than the average student. Because of this they drink more water than before.

Discussion
Because the assessment where for the whole group after every meeting, we cannot say if everyone gained knowledge. Because of the lack of time we could not do a food record diary, to see if everyone gained knowledge and implement this in their daily intake. This could have been corrected if we put more attention about the diary to the students.

² Statistical Package for the Social Sciences (statistical computer software)
9 Recommendations

Completed our intervention, we would like to make some recommendations for the following years to our client Brord Brugman and consequently to the Caland Lyceum.

First of all, we hope that all the intervention has been positive and with that the young players have learned more about nutrition and, above all, they have learned to use that knowledge to themselves.

We would like to thank our client for the help he gave us and the various ideas we have been suggesting throughout intervention. All this showed how interested and motivated our client was during the intervention, transmitting us motivation to do better and more.

One idea of the client was to film all meetings, or nearly all, that we do with young players, making possible to verify how it went and allowing drawing conclusions and improve in next intervention. Another idea was the Flyer, thus allowing our information to be transmitted to other young people of the following years, and allowing them to take home a small guide on the best nutrition for them.

We leave here now, some recommendations we feel are important:

- Provide a piece of fruit for after training, encouraging young players to eat more fruit. They are growing and their need for vitamins and minerals is great for staying healthy and strong.
- Distribute and use the flyer produced, in this exists all the necessary information, in a simple way and easy to understand for young players begin to change their habits.
- Promote healthy nutrition, using the bar from school to sell more fruit and healthy snacks for all children. They spend most of their time in school, if we want to help children improve their nutritional patterns, the school is the best place to get it.
- Promote a nutrition day in the school for all the students, with some works, presentations and flyers, to make the children aware of how important is have a good nutrition and more important a good sport nutrition.
- Use our intervention in next years, but in a long period of time (around 3 months). In our presentations we have all the subjects about basic and sport nutrition necessary and in a good and easy way to children understand.
References


## General Nutrition Questionnaire

### Personal Information
- Name: 
- Date of Birth: 
- Gender: 
- Age: 
- Weight: 

### Physical Activity Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Time</th>
<th>Tuesday</th>
<th>Time</th>
<th>Wednesday</th>
<th>Time</th>
<th>Thursday</th>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Friday</th>
<th>Time</th>
<th>Saturday</th>
<th>Time</th>
<th>Sunday</th>
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### Questions

- Do you smoke? 
- Do you drink alcohol? 
- Have you used drugs somewhere in the last three months? 
- How many cigarettes per week? 
- How many glasses per week? 
- What kind of alcohol? 
- What kind of drugs? 

- How many hours do you sleep per night? 
- How fast did you feel during the day? 

### Weight Change

- Have you recently lost or gained weight? 
- No 
- Lost 
- Gained 
- How many lb? 

### Healthy Meal

To your opinion, what is a healthy meal?

### Overall Energy Level

Rate from 1 to 5:
- Your energy level during the day
- Your energy level after exercise
- Your daily stress level
- How important do you think it is to change your current nutrition habits to sport nutrition?
- How hard do you think it is going to be to change your nutrition habits?
- How much will your parents help you with changing your nutrition habits?
- How much do your friends encourage you to eat unhealthy?
- How able do you feel to organize your nutrition it will benefit you and your sports performance?

### Obstacles

Is there anything that will stand in your way when it comes to changing your nutrition habits to sport nutrition?

### Overall Health

On a scale of 1 to 10, how healthy do you think you are? 

In what areas can you improve your health? 

Do you have a medical condition? 

If so, what?
Please fill in the food diary for three days. You can find the diary on the next pages. You will fill it in for a practice day, a non-practice day and a game day.

You will have to fill in the foods and drinks you take in and on what time. Also, give us an estimation of how much you eat or drink. This can be in how many glasses or how many spoons, but also in grams or liters. As long as you put it down as accurate as you can.

In the last column you will fill in if you think the choice of food/drink you made was a healthy (green), not so healthy (orange) or unhealthy (red) choice. Don’t look it up, just write down what you think.

Here is an example:

<table>
<thead>
<tr>
<th>Time</th>
<th>What did you eat/drink</th>
<th>How much</th>
<th>Healthy choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Havermout</td>
<td>100 gram</td>
<td>green</td>
</tr>
<tr>
<td></td>
<td>Banaan</td>
<td>1</td>
<td>green</td>
</tr>
<tr>
<td>12:00</td>
<td>Magere kvark</td>
<td>500 gram</td>
<td>green</td>
</tr>
<tr>
<td></td>
<td>Volkoren brood</td>
<td>4 sneetjes</td>
<td>green</td>
</tr>
<tr>
<td></td>
<td>Melk</td>
<td>2 glazen</td>
<td>orange</td>
</tr>
<tr>
<td>14:00</td>
<td>Red-bul</td>
<td>1 blikje</td>
<td>red</td>
</tr>
<tr>
<td>15:00</td>
<td>Tiet aar</td>
<td>2</td>
<td>oranje</td>
</tr>
<tr>
<td></td>
<td>Rijst</td>
<td>2 opschelepels</td>
<td>green</td>
</tr>
<tr>
<td></td>
<td>cola</td>
<td>1 glas</td>
<td>red</td>
</tr>
<tr>
<td>20:00</td>
<td>water</td>
<td>2 glazen</td>
<td>groen</td>
</tr>
<tr>
<td>Time</td>
<td>What did you eat/ drink</td>
<td>How much</td>
<td>Healthy choice</td>
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<thead>
<tr>
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</tbody>
</table>
WHO (2007)
WHO (2007)
B.2 [Fat Percentage for Children]

Jebb S. et.al. (2004)
C [POWERPOINT INTRODUCTION PRESENTATION]
Question 2
Which product has more calories?
Answer: BOS

Question 3
How much water should you drink every day?
Answer: BOS

Question 4
What is one of the five main food groups?
Answer: GREEN

Question 5
Is it good to eat fats?
Answer: RED

Question 6
What is the most important thing you need to ingest to keep you alive?
Answer: GREEN

Question 7
What is more healthy?
Answer: RED

Question 8
In what product can you find Vitamin C?
Answer: BOS
Basic Nutrition - Caland
Youth Basketball Program

Why is proper nutrition important?
- All living things need food and water to live.
- All human beings need “good food” to live well.
- Food energy (measured in calories):
  - Carbohydrates: 1 gram = 4 calories
  - Fats: 1 gram = 9 calories
  - Proteins: 1 gram = 4 calories
- Proper nutrition provides the body with the nutrients necessary to build, maintain, and repair tissues.

Types of Nutrients
- Macro-Nutrients – essential for human survival and growth
  - Carbohydrates
  - Proteins
  - Fats
- Micro-Nutrients – essential for growth and enhance the function and usability of macro-nutrients
  - Vitamins
  - Minerals

The difference between macro and micro nutrients is the amount each needs daily. Macro-nutrients must exceed one gram per day.

Carbohydrates
- Minerals
  - Provide the energy fuel to convert to energy.
  - 100 grams of energy can be used per day.
- Three types of carbohydrates:
  - Oatmeal, pasta, bread, rice, and potatoes are new energy proteins. Some carbohydrates are not sources of energy, proteins nor carbohydrates.
  - Provide your muscles.
  - Regulate the amount of sugar circulating in your body.
  - Aid in the body’s absorption of fats.
  - Help lower cholesterol levels and regulate blood pressure.

Proteins
- Used for tissue growth (muscle) and repair.
- 10-15% of energy intake per day.
- Two types of Proteins:
  - Complete Proteins: contain sufficient amount of all essential amino acids.
  - Incomplete Proteins: meaning do not have enough essential amino acids.
- Protein is the building blocks for protein (20 different types).
- When protein molecules in your body is broken down with infusions.
- The more intense your exercise, the more protein is required for repair and growth.

Fats
- A healthy body needs fat.
- 25% of energy intake per day.
- Two types of fat:
  - Saturated fat: provides a source of stored fat.
  - Unsaturated fat: contains your heart.
- Fat as an insulator in order to reduce heat loss.
- Protects your organs if you fall or are injured.
Vitamins and Minerals

- Vitamins and minerals act as catalysts for a variety of bodily functions.
- Vitamins are essential for:
  - Making healthy tissues such as bones, skin, glands, nerves, and blood.
  - Aid in the metabolism of proteins, fats, and carbohydrates to release energy.
  - Nervous system.
  - Preventing certain deficiency diseases.
- Minerals are essential for:
  - The formation of strong bones and teeth.
  - Muscle and nerve function.
  - Regulation of body fluid balance.
  - Muscle contractions.
  - Minerals and many vitamins must be supplied through diet since they are not made in the body.

Water

- Your overall body consists of 70-80% of water.
- Your muscles are about 75% water.
- Your body needs water to:
  - Digest food.
  - Carry waste products out of your body.
  - Regulate body temperature.
  - Lubricate moving parts.
  - Your body does not store water so you must take in a new supply every day.

Key Concepts to an Effective Nutritional Plan

- Breakfast is the most important meal of the day.
- Attempt to eat 4-4 meals per day.
- Minimum of 8 glasses of water per day.
- Attempt to consume carbohydrates, proteins, and fats in every meal.
- Vegetables are the best source of vitamins and minerals.

Results of Poor Nutrition

- Obesity.
- Being too skinny.
- Not growing well.
- Bones may break due to lack of calcium.
- Gum may bleed due to low Vitamin C.
- Low iron count can make you feel tired.
E [SUBJECTS WORKSHOP ‘SPORTS NUTRITION’]

1. What’s the difference between a non-athletes’ diet and an athletes’ diet?
2. How can good nutrition help you in basketball?
3. What does good hydration mean?
4. What are macro- and micronutrients?
5. Name a type of food/drink that can help you recover faster after a practice or game
6. What should you NOT eat before a practice or game?
7. When should you eat your meal before a practice or game?
8. Name a meal you can eat before a game
9. What is energy balance?
10. What is a normal fat percentage for your age (non-athlete)?
11. How many times more energy do you use during a basketball game (8) than sitting quietly?
   And a hard practice (9.3)? And just shooting baskets (4.5)?
12. What kind of drink should you take during practices or games? (Water/isotonic)
13. What is your main energy source during exercise?
14. What’s the difference between fast and slow sugars? Name the types of food.
15. What should you eat after practice?
16. Does it matter when you eat after practice? Why?
17. What is the effect of coffee/thee on your performance? Should you drink coffee/thee?
18. Do you need to monitor your nutrition all the time?
19. Do you need to take supplements?
20. What type of macronutrient should your breakfast contain?
21. When should you drink the most amount of water?
22. Write down an example of day where you eat ‘perfect’ from the morning until after practice, when you go to sleep.
23. What should you eat every day?
24. How many calories do you think you eat per day? And how many do you think you need?
25. What can happen if you don’t have a good nutrition pattern?
26. Which micronutrients are most important for you as a young athlete? (Calcium, iron (oxygen carrying), vitamin b6 (energy and blood health) and zinc (wound healing, tissue growth)).
27. What types of carbohydrates (fast/slow) you need after practice/game?
28. How many carbohydrates do you need as a young athlete? (5-8 g/kg)
29. Do you change your nutrition pattern if you are injured or during summer?
30. What can you change in your own personal nutrition pattern?
31. What is a good snack?
32. Why is breakfast the most important meal during the day?
G [LINKS TO VIDEOS PRESENTATIONS]

Introduction presentation: [https://vimeo.com/60895256](https://vimeo.com/60895256)

Meeting with the parents: [https://vimeo.com/61369967](https://vimeo.com/61369967)

‘Sports Nutrition’ workshop: [https://vimeo.com/67082853](https://vimeo.com/67082853)

All videos are protected with a password. Enter ‘nutrition’ to view the video.
H [PERSONAL NUTRITION ADVICES]

Below you will find the advices for the eleven athletes of the intervention group.

<table>
<thead>
<tr>
<th>1. Ella</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>15 y</td>
<td>BMI = 19.1 kg/m² ±2.2 kg/m²</td>
</tr>
<tr>
<td>69.6 kg</td>
<td>Fat% = 19.8% 15-30%</td>
</tr>
<tr>
<td>191 cm</td>
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</table>

In general you eat healthy. There are some points that you can improve:
- Try to have six eating moments per day. You can eat a healthy snack between breakfast and lunch and after lunch as well.
- You can eat more than you do now, as long as you keep it healthy.
- Eat more foods rich in protein (like chicken, low-fat dairy products and eggs).
- Drink more water! 2-3 liters per day.

Advice for practice days
- Eat a meal rich in carbohydrates before practice (like pasta, rice and beans), also on afternoon practices.
- Drink a lot of fluids during practice (1 liter per hour), preferably water.
- Drink/ eat something rich on proteins right after practice (within the hour).

Advice for game days
- Eat a large(r) breakfast, rich on carbohydrates (like fruits and whole grain foods).
- Drink a lot of water a couple of hours before your game.
- Try not to eat your bigger meal (with carbohydrates) 2-3 hours before your game.
- You can eat a small snack till an hour before your game, if you’re still hungry.

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<tr>
<th>2. Raoul</th>
<th>Reference</th>
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<tbody>
<tr>
<td>15 y</td>
<td>BMI = 23.4 kg/m² ±2.0 kg/m²</td>
</tr>
<tr>
<td>72.5 kg</td>
<td>Fat% = 13.3% 10-21%</td>
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<tr>
<td>176 cm</td>
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</tbody>
</table>

You really eat too little during the day. Here is some general advice:
- You should eat around 6 times per day.
- Don’t go 3 hours without eating anything.
- You should drink 2-3 liters water every day.
- You should eat at least 2 pieces of fruit and 300 grams of vegetables per day.
- Try to avoid sweets.
- You should eat proteins, carbohydrates and fats every day.

Advice for practice days:
- Eat a meal rich in carbohydrates before practice (like pasta, rice and beans), also on afternoon practices.
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Advice for game days:
- Eat a large(r) breakfast, rich on carbohydrates (like fruits and whole grain foods).
- Eat your breakfast within the hour you get up.
- Drink a lot of water a couple of hours before your game.
- Try not to eat your bigger meal (with carbohydrates) 2-3 hours before your game.
- You can eat a small snack till an hour before your game, if you're still hungry.

### 3. Lisanne

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<th>Reference</th>
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</table>
| BMI = 21.5 kg/m² | ±22 kg/m²  
| Fat% = 28% | 15-30%  
| 68 kg | 178 cm |

In general you eat healthy. There are some points that you can improve:
- Try to have six eating moments per day. You can eat a healthy snack between breakfast and lunch and after lunch as well.
- Try to put healthier foods on your bread during breakfast (and lunch).
- Eat more foods rich in protein (like chicken, low-fat dairy products and eggs).
- Try not to eat snacks or unhealthy foods late in the evening.
- Try to eat healthy, also on non-practice days.
- You should eat at least 2 pieces of fruit and 300 grams of vegetables per day.

Advice for practice days:
- Eat a meal rich in carbohydrates before practice (like pasta, rice and beans), also on afternoon practices.
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- Drink a lot of water a couple of hours before your game.
- Try not to eat your bigger meal (with carbohydrates) 2-3 hours before your game.
- You can eat a small snack till an hour before your game, if you’re still hungry.
- After the game, you can eat fruits and healthy snacks, but no foods high on fat.

### 4. Yaron

<table>
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<th>Reference</th>
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</thead>
</table>
| BMI = 20 kg/m² | BMI: 19  
| Fat% = 5.7 | Fat%15-21  
| 75.1 kg | 193.5 cm |

**Pre-game/practice meal**

The primary purpose of the pre-game meal is to offset fatigue during the game. There is no one-size-fits-all prescription because different people react differently to the same foods. Athletes should try to find food that won’t cause GI distress and will help to maintain focus and endurance.

**Guidelines:**
- Eat low-glycemic foods, such as whole grain cereals, certain fruits, sandwiches made with whole wheat bread, etc., approximately two to three hours before a competition. The closer to your match, the smaller the meal. This will help sustain blood-sugar levels.
- Keep protein and fat intakes low because they slow digestion.
- Avoid bulky foods, like raw fruits and vegetables, dry beans, peas and popcorn, which can stimulate bowel movements.
- Avoid gas-forming foods such as vegetables from the cabbage family and cooked dry beans.
• Drink 400 to 600 mL (14 to 22 oz.) of fluid two to three hours before exercise depending on tolerance
• Do not try new foods just before a match. Eat foods familiar with your digestive system.
• Some athletes prefer to use their favorite foods, which may give them a psychological edge.

**During the Game**
Although eating as directed above will allow you to top off glycogen stores coming into the event, you still have to contend with two potential enemies, these are dehydration and rapid glycogen utilization and depletion.

**Dehydration**
When games drag out longer than expected, you can lose a great deal of sweat, and become dehydrated. A player’s rate of fluid loss will depend on the environmental conditions, intensity of play, acclimatization, aerobic fitness, hydration status, age, and gender.

**Glycogen Depletion**
Glycogen depletion varies with the intensity of the game and aerobic fitness level. Although liquid carbohydrates can help restore lost glycogen, it is never replenished as fast as it is lost. To remedy both problems, bring a water bottle containing isotonic sport drinks. Still, something is better than nothing. It is important to consume carbohydrates in order to prevent performance decrease. For games longer than an hour, a carbohydrate-electrolyte drink, rather than water, is recommended.

**Post-Game Meal (important)**
Consume 1.5 g/kg bodyweight of CHO-rich, low fiber foods and beverages within 30 minutes or as soon as possible after a game and again every two hours for four to six hours to replace glycogen stores. This may be difficult when traveling, but failing to do so will encourage under-recovery and potential muscle wasting.

Combination of CHO and protein has the added benefit of stimulating amino acid transport, protein synthesis and muscle tissue repair, all of which will further speed recovery and re-energize you for your next competition.

It is better to consume the “meal” as a liquid in order to facilitate recovery faster, and follow with a variety of whole-foods between two and four hours later.

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<th>5. Lawrence</th>
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<tbody>
<tr>
<td>14 y</td>
<td>BMI = 18.4 kg/m²</td>
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<tr>
<td>62.7 kg</td>
<td>Fat% = 9.3%</td>
</tr>
<tr>
<td>184.5 cm</td>
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</tbody>
</table>

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<th>6. Joost</th>
<th>Reference</th>
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<tbody>
<tr>
<td>14 y</td>
<td>BMI = 21.9 kg/m²</td>
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<tr>
<td>76.7 kg</td>
<td>Fat% = 14.3%</td>
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<tr>
<td>187 cm</td>
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During the Game

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Dehydration

When games drag out longer than expected, you can lose a great deal of sweat, and become dehydrated. A player’s rate of fluid loss will depend on the environmental conditions, intensity of play, acclimatization, aerobic fitness, hydration status, age, and gender.

Glycogen Depletion

Glycogen depletion varies with the intensity of the game and aerobic fitness level. Although liquid carbohydrates can help restore lost glycogen, it is never replenished as fast as it is lost. To remedy both problems, bring a water bottle containing isotonic sport drinks. Still, something is better than nothing. It is important to consume carbohydrates in order to prevent performance decrease. For games longer than an hour, a carbohydrate-electrolyte drink, rather than water, is recommended.

Post-Game Meal (important)

Consume 1.5 g/kg bodyweight of CHO-rich, low fiber foods and beverages within 30 minutes or as soon as possible after a game and again every two hours for four to six hours to replace glycogen stores. This may be difficult when traveling, but failing to do so will encourage under-recovery and potential muscle wasting.

Combination of CHO and protein has the added benefit of stimulating amino acid transport, protein synthesis and muscle tissue repair, all of which will further speed recovery and re-energize you for your next competition.

It is better to consume the “meal” as a liquid in order to facilitate recovery faster, and follow with a variety of whole-foods between two and four hours later.
7. Gijs

<table>
<thead>
<tr>
<th></th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 y</td>
<td>BMI = 17.9 kg/m²</td>
</tr>
<tr>
<td>58 kg</td>
<td>Fat% = 10.7 %</td>
</tr>
<tr>
<td>181 cm</td>
<td>BMI = 19 kg/m²</td>
</tr>
<tr>
<td></td>
<td>Fat% = 15-21%</td>
</tr>
</tbody>
</table>

Pre-game/practice meal
The primary purpose of the pre-game meal is to offset fatigue during the game. There is no one-size-fits-all prescription because different people react differently to the same foods. Athletes should try to find food that won’t cause GI distress and will help to maintain focus and endurance.

Guidelines:
- Eat low-glycemic foods, such as whole grain cereals, certain fruits, sandwiches made with whole wheat bread, etc., approximately two to three hours before a competition. The closer to your match, the smaller the meal. This will help sustain blood-sugar levels.
- Keep protein and fat intakes low because they slow digestion.
- Avoid bulky foods, like raw fruits and vegetables, dry beans, peas and popcorn, which can stimulate bowel movements.
- Avoid gas-forming foods such as vegetables from the cabbage family and cooked dry beans.
- Drink 400 to 600 mL (14 to 22 oz.) of fluid two to three hours before exercise depending on tolerance.
- Do not try new foods just before a match. Eat foods familiar with your digestive system.
- Some athletes prefer to use their favorite foods, which may give them a psychological edge.

During the Game
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Combination of CHO and protein has the added benefit of stimulating amino acid transport, protein synthesis and muscle tissue repair, all of which will further speed recovery and re-energize you for your next competition.
It is better to consume the "meal" as a liquid in order to facilitate recovery faster, and follow with a variety of whole-foods between two and four hours later.
### 8. Cas

**Age:** 14 years  
**BMI:** 16.7 kg/m²  
**Weight:** 46.9 Kg  
**Height:** 167.5 cm

**Reference**

<table>
<thead>
<tr>
<th>Age: 14 years</th>
<th>BMI: 16.7 kg/m²</th>
<th>BMI: 15.5 - 22</th>
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</thead>
<tbody>
<tr>
<td>Weight: 46.9 Kg</td>
<td>Fat%: 16.9%</td>
<td>Fat%: 10% - 20%</td>
</tr>
<tr>
<td>Height: 167.5 cm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In general have a good diet, but there are some points that could be improved:

- Drink less juice and drink more water;
- Eat more fruit and vegetables throughout the day;
- Eat more foods rich in protein.
- Do not exceed three hours without eating.
- Avoid eating so much bread to exchange for one or two pieces of fruit.

On training days:

- Drink more water during the day (Approximately: 3L);
- After the workout eat a piece of fruit (e.g. banana);
- Post workout meal (dinner) should include protein to aid in muscle recovery (Chicken, Salmon, Tuna).

On game days:

- Do not exceed three hours without eating.
- You should opt for a mid-morning snack (fruit, yogurt);
- Meal before game (2-3 hours before), rich in CHO (Ex: pasta, brown rice, sweet potatoes).
- After the game, piece of fruit to help restore energy;
- A full dinner that includes protein, good fats and CHO.

### 9. Name: Dajo

**Age:** 15 years  
**BMI:** 16.8 kg/m²  
**Weight:** 52 Kg  
**Height:** 175 cm

**Reference**

<table>
<thead>
<tr>
<th>Age: 15 years</th>
<th>BMI: 16.8 kg/m²</th>
<th>BMI: 16 - 22.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight: 52 Kg</td>
<td>Fat%: 8.9%</td>
<td>Fat%: 10.5% - 21%</td>
</tr>
<tr>
<td>Height: 175 cm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In general have a good diet, but there are some points that could be improved:

- Drink less juice and drink more water;
- Eat more fruit and vegetables throughout the day;
- Eat more foods rich in protein.
- Do not exceed three hours without eating.
- Beware of sweets, choose one or two days a week to eat.
- Eat less bread exchange for one or two pieces of fruit.
- Beware of peanut butter, all that is in excess is bad.
- Breakfast is the most important meal of the day, why should contain protein, good fats and CHO.

On training days:

- Drink more water during the day (Approximately: 3L);
- After the workout eat a piece of fruit (e.g. banana);
- Post workout meal (dinner) should include protein to aid in muscle recovery (Chicken, Salmon, Tuna).

On game days:

- Spend less time without eating, most 3h.
- Meal before game (2-3 hours before), rich in CHO (Ex: pasta, brown rice, sweet potatoes).
- After the game, piece of fruit to help restore energy;
- A full dinner that includes protein, good fats and CHO.
10. Name: Keyshawn

<table>
<thead>
<tr>
<th>Age: 13 years</th>
<th>BMI: 15,7 kg/m²</th>
<th>Reference</th>
<th>BMI: 15 – 21,5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight: 37 Kg</td>
<td>Fat%: 8,7 %</td>
<td></td>
<td>Fat%: 12% - 22%</td>
</tr>
<tr>
<td>Height: 155 cm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In general have a good diet, but there are some points that could be improved:

- Drink less juice and drink more water;
- Eat more fruit and vegetables throughout the day;
- Eat more foods rich in protein.
- Do not exceed three hours without eating.
- Breakfast is the most important meal of the day, why should contain protein, good fats and CHO.
- Attention to crisps, pick a day or two a week to eat.

On training days:

- Drink more water during the day (Approximately: 3L);
- After the workout eat a piece of fruit (e.g. banana);
- Eat something between the two hours before training (Sandwich, or 1 or 2 pieces of fruit).
- Post workout meal (dinner) should include protein to aid in muscle recovery (Chicken, Salmon, Tuna).

On game days:

- Spend less time without eating, most 3h.
- Meal before game (2-3 hours before), rich in CHO (Ex: pasta, brown rice, sweet potatoes).
- After the game, piece of fruit to help restore energy;
- A full dinner that includes protein, good fats and CHO.

11. Name: Pien

<table>
<thead>
<tr>
<th>Age: 14 years</th>
<th>BMI: 22,9 kg/m²</th>
<th>Reference</th>
<th>BMI: 15,5 - 23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight: 66Kg</td>
<td>Fat%: 25,1</td>
<td></td>
<td>Fat%: 16% - 29,5%</td>
</tr>
<tr>
<td>Height: 178 cm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In general have a good diet, but there are some points that could be improved:

- Drink more water during the day;
- Eat more fruit and vegetables throughout the day;
- Eat more foods rich in protein.
- Do not exceed three hours without eating.
- Beware of sweets, choose one or two days a week to eat.
- Breakfast is the most important meal of the day, why should contain protein, good fats and CHO.

On training days:

- Drink more water during the day (Approximately: 3L);
- After the workout eat a piece of fruit (e.g. banana);
- Post workout meal (dinner) should include more protein to aid in muscle recovery (Chicken, Salmon, Tuna) and less CHO.
On game days:

- Spend less time without eating, most 3h.
- Meal before game (2-3 hours before), rich in CHO (Ex: pasta, brown rice, sweet potatoes).
- After the game, piece of fruit to help restore energy;
- A full dinner that includes protein, good fats and CHO.
The ASE model is frequently used in the Netherlands in recent years as a basis for the development of interventions to promote healthy behavior. The ASE model is based on the Theory of planned behavior and comes to explaining behavior through analysis in terms of attitude, social influences and self-efficacy. Below are all parts of the ASE model discussed.

**Intention**
With (behavioral) intent is intended to indicate someone is planning to implement. Certain behavior (Bridge, Assema, & Lechner, 2010) People planning to include more exercise and eat healthier. The ASE model proposes that behavior is explained with the intention to show that behavior. The intention is in turn held back from three main determinants:
- Attitude
- Social influences
- Self-efficacy

**Attitude**
Attitudes give direction to behavior, but are certainly not the same behavior. The behavior itself may be an object of an attitude. So people can have a positive or even negative attitude towards the behavior eg ‘smoking’. Attitudes about behaviors are also formed on the basis of prior learning.

Attitudes are not only based on logical reasoning and intellectual considerations, but also deep-rooted customs and beliefs. For example, an attitude towards smoking based on either cognitive attitudes or beliefs (“smoking is unhealthy”, “smoking gives you cancer”), as well as more affective, moral or ethical beliefs (if I smoke I can the world better’, ‘smoking in small children, I cannot make’). The attitude of a person, according to Fishbein and Ajzen (1975) can be determined by asking for a total judgment, for example direct ‘smoking is not good’. One can also try to identify the attitude structure in the specific views or beliefs that connects the person to the behavior (Brug, Assema, & Lechner, 2010).

**Social influences**
Besides its own health behavior attitude is also influenced by the social environment of the person. The perceived influence of the social environment of a person is measured by means of social support or pressure experienced by the social environment and the modeling (modeling) that one sees in others (Vries, Dijkstra, & Kuhlman, 1988).

When social support or social pressure involves more direct influences of others. Social pressure occurs for example when someone is encouraged to smoke, use drugs or to have a drink. By his friend Social support occurs for example when you are actively supported to quit smoking, because people around you your heart and stabbing and urge you to persevere. The term "social pressure" is generally used when there is a negative impact on the desired behavior. "Social support’ is used when there is a positive impact on the desired behavior. Besides emotional social support ("I'm here for you’), social support also practical ("I’ll help you to remove all smoking materials out of the house’), or, ultimately, material social support ("I will stop-smoking course before you pay’).

When modeling involves learning by observing other people’s behavior. When in one area many people smoking, it is more likely that this person also take up smoking themselves especially if that behavior benefits for smokers appear to be connected (Brug, Assema, & Lechner, 2010).

**Self-efficacy**
A third important determinant is introduced by Bandura (1986) concept of self-efficacy expectations. Self-efficacy is the expectation that people have about their own ability to perform a
particular behavior or: eight one is able to perform themselves the appropriate behavior. This concept appears, along with the attitude that people have about a particular behavior, among the most important predictors of many personal health behaviors (Conner & Norman, 2005).

According to Bandura’s self-efficacy expectations vary in three dimensions:

1. **Magnitude**: The estimation of the difficulty of the skills needed in order to perform the behavior.
2. **Generality**: The assessment of the problems that the same behavior different situations can bring.
3. **Strength**: The extent to which one has to perform behavioral self-confidence.

**Skills**
Estimates of self-efficacy will tend strongly related to their own skills, but this is not necessarily the case. Bandura describes an experiment Collins (Bandura, 1986) with children with the same skills to solve math problems but with different self-efficacy expectations about solving math problems. Children with high self-efficacy expectations were better able to solve than the children with low self-efficacy expectations. Mathematics problems (Brug, Assema, & Lechner, 2010).

**Barriers**
Unfortunately, it is a positive intention to carry out a long behavior is not always a guarantee that people will also perform. Everyone has good intentions that are not successful. There can be barriers that impede the implementation in the way (e.g. I was going to go running, but it was bad weather).