

MYP Personal Project - Diet plan for diabetic athletes

Introduction

This document outlines my personal project, "Meal Plan for Diabetic Athletes," designed to address the challenges faced by diabetic athletes in managing their blood sugar levels while optimizing performance. The project explores research-backed insights, personal experiences, detailed planning, and a reflective conclusion to highlight the impact of balanced nutrition on athletic success.

1. Research

- Overview of research process.
- Exploration of over two dozen websites on best practices, diet plans, meal routines, and performance optimization for diabetic athletes.
- Summative report with key findings.
- References to all sources consulted.

2. Personal Project Development - Criteria A

- Conceptualization of the meal plan inspired by research findings.
- Integration of personal experience as a diabetic athlete to tailor solutions.
- Creation of a personalized diet plan for athletes with adaptable options for varying blood sugar ranges.

3. Plan and Project Details - Criteria B

- Detailed timelines for project execution.
- Statistical insights and data analysis.
- Diagrams showcasing meal plans and glucose management strategies.
- Tools and methodologies used to measure success.

4. Conclusion and Reflection - Criteria C

- Reflection on the project's outcomes and its alignment with IB learner profiles and attitudes.
 - Mapping the project's influence on positive reinforcement of attributes like knowledge, balance, and open-mindedness.
 - Future possibilities for expanding and refining the meal plan for broader applicability.
-

A. Research - Diet Plan for Diabetic Athletes

Maintaining stable blood sugar levels while training and competing is a significant challenge for athletes with diabetes. This article examines the unique nutritional needs of diabetic athletes and the impact of different blood sugar ranges on their performance. Based on the research, a comprehensive diet plan is proposed, incorporating adaptive strategies to optimize athletic performance while effectively managing blood sugar levels.

Introduction

Diabetes presents unique challenges for athletes, requiring careful management of blood sugar levels to optimize performance and overall health. This paper delves into the specific nutritional needs of diabetic athletes, examining the impact of varying blood sugar ranges on athletic performance and exploring adaptive diet strategies. The aim is to design a comprehensive diet plan that caters to the unique demands of diabetic athletes, enabling them to excel in their chosen sports while effectively managing their condition.

Nutritional Needs of Diabetic Athletes

Diabetic athletes have specific nutritional needs that must be carefully considered to maintain stable blood sugar levels and support optimal performance. These needs include:

- **Carbohydrates:** Carbohydrates are the primary source of energy for athletes, and diabetic athletes need to consume adequate amounts to fuel their training and competition. However, the type and timing of carbohydrate intake are crucial. Complex carbohydrates with a low glycemic index (GI) are preferred as they provide sustained energy release without causing rapid spikes in blood sugar levels. Examples include whole-grain bread, fruits, and vegetables¹. For diabetic athletes, it's essential to consume carbohydrates with a low glycemic index (less than 55). These types of foods, such as high-fiber fruits, legumes, and whole-grain bread, gradually raise blood glucose levels, unlike simple carbohydrates found in processed foods and sugary drinks, which can cause rapid spikes in blood sugar¹.
- **Protein:** Protein is essential for muscle growth and repair, which is particularly important for athletes. Diabetic athletes should aim for a protein intake of 1.2-2.0 g/kg of body weight to support muscle mass maintenance². Good sources of protein include lean meats, fish, eggs, and dairy products.
- **Fats:** Healthy fats are important for overall health and hormone production. Diabetic athletes should include sources of healthy fats in their diet, such as olive oil, avocados, and nuts³.
- **Fiber:** Fiber helps regulate blood sugar levels and promotes satiety. Diabetic athletes should include plenty of fiber-rich foods in their diet, such as fruits, vegetables, and whole grains³.
- **Hydration:** Staying hydrated is crucial for all athletes, especially those with diabetes. Dehydration can exacerbate hyperglycemia and impair performance. Diabetic athletes should drink plenty of fluids throughout the day, particularly before, during, and after exercise².

It's important to note that a healthy diet with good food variety, matched with insulin and regular exercise, is crucial for diabetes management. Accurate carbohydrate counting matched to insulin should be mastered before applying sports nutrition principles⁵.

Impact of Blood Sugar on Athletic Performance

Blood sugar levels play a critical role in athletic performance. Both hypoglycemia (low blood sugar) and hyperglycemia (high blood sugar) can negatively impact an athlete's ability to train and compete⁶.

Hypoglycemia can lead to fatigue, dizziness, weakness, and impaired concentration, hindering an athlete's performance and potentially leading to serious health consequences⁶.

Hyperglycemia can impair energy production, cause dehydration, and increase the risk of long-term health complications⁷. Research indicates that acute hyperglycemia may not significantly affect aerobic exercise performance. However, it may impair anaerobic performance, neuromuscular function (particularly isometric knee extension strength), and neurocognitive performance. The impact of hyperglycemia on performance may also depend on circulating insulin levels⁸.

Therefore, maintaining stable blood sugar levels within the target range is crucial for diabetic athletes to optimize their performance and overall health.

Adaptive Diets for Athletes

Adaptive diets are personalized nutrition plans that adjust to an individual's specific needs and goals. For athletes, these diets often focus on optimizing nutrient intake to support training, performance, and recovery. Some examples of adaptive diets for athletes include:

- **Mediterranean Diet:** This diet emphasizes whole foods, such as fruits, vegetables, whole grains, and lean protein, with a focus on healthy fats like olive oil. It is a balanced and sustainable approach that can benefit athletes by providing sustained energy and reducing inflammation.
- **Paleo Diet:** This diet focuses on whole, unprocessed foods that were presumably eaten by our ancestors during the Paleolithic era. It includes lean meats, fish, fruits, vegetables, nuts and seeds, while excluding grains, legumes, and processed foods. This approach can be beneficial for athletes seeking to improve body composition and reduce inflammation.
- **DASH Diet:** This diet is designed to lower blood pressure but is also a healthy and balanced approach for athletes. It emphasizes fruits, vegetables, whole grains, lean protein, and low-fat dairy, while limiting saturated fat, cholesterol, and sodium⁹.

Nutrient Timing for Diabetic Athletes

Proper nutrient timing is crucial for diabetic athletes to maintain blood sugar control and optimize performance. Here are some specific recommendations:

- **Before exercise:** Consume a carbohydrate-based meal or snack within one to three hours of exercise. Examples include a peanut butter and jelly sandwich, Greek yogurt with granola, or an apple with nut butter³.
- **During exercise:** For activities lasting longer than an hour, plan to have a snack during the activity. Keep fresh or dried fruit, crackers, hard candies, dextrose tablets, and granola bars with you as a form of carbohydrates³. For activities lasting longer than one hour, consume 30-60 grams of carbohydrates per hour¹⁰.
- **After exercise:** Be sure to eat something to replenish your glycogen stores and prevent hypoglycemia. Examples include chicken and rice, pasta and turkey, or grilled potatoes with scrambled eggs and fruit¹¹. Consume a carbohydrate-rich snack or meal within 30-60 minutes after exercise and again around 2 hours after exercise¹⁰. Consume 15-30 grams of high-quality protein at least 2 hours after exercise¹⁰.

Identity and Athletic Performance in Diabetic Athletes

For diabetic athletes, identity is often intertwined with their ability to manage their condition and perform at their best. The challenges of diabetes can impact their self-perception and their relationship with their sport¹². While some athletes may view diabetes as a challenge to overcome, others may struggle with the limitations imposed by the condition. It's important to acknowledge the diverse experiences of diabetic athletes and the potential psychological impact of diabetes¹³.

Studies have shown that diabetic athletes who successfully manage their condition and achieve high levels of

performance often possess strong psychological resources, such as resilience, self-efficacy, and a positive mindset¹². These athletes utilize various strategies to manage anxiety related to their blood sugar levels, including:

- **Managing insulin and nutrition intake:** This involves careful planning and monitoring of blood sugar levels.
- **Embracing social support networks:** Connecting with family, friends, and other athletes with diabetes can provide emotional support and encouragement.
- **Using technology:** Continuous glucose monitors and insulin pumps can help athletes track their blood sugar levels and adjust insulin doses as needed.
- **Practicing relaxation techniques:** Mindfulness, deep breathing, and other relaxation techniques can help manage stress and anxiety.
- **Establishing routines:** Consistent pre-competition routines can provide a sense of control and reduce anxiety.
- **Performing pre-competition aerobic exercise:** Light aerobic exercise can help stabilize blood sugar levels before competition.
- **Maintaining adequate sleep hygiene:** Sufficient sleep is essential for overall health and well-being, including blood sugar management¹³.

The number of athletes with type 1 diabetes in high school and college sports may be similar to that of individuals with type 1 diabetes in the general population¹⁴. However, it's important to be aware of the potential risks associated with exercise for diabetic athletes, including hypoglycemia, skin perfusion issues, impaired sweating, and an increased risk of heat-related illness¹⁴.

Personal Accounts of Diabetic Athletes

Many diabetic athletes have shared their personal experiences of managing their condition while pursuing their athletic goals. These accounts provide valuable insights into the challenges and triumphs of competing with diabetes.

For example, NFL tight end Mark Andrews, diagnosed with type 1 diabetes at age 9, meticulously manages his blood sugar levels during games by checking his levels approximately 30 times and using an insulin pump and continuous glucose monitor¹⁵. He emphasizes the importance of a steady diet and the support of his training staff in maintaining stable blood sugar levels.

Similarly, former professional baseball player Jason Johnson, diagnosed with type 1 diabetes as a child, successfully navigated the demands of Major League Baseball while managing his condition. In 2004, he became the first major leaguer to wear an insulin pump during on-field play¹⁶. His experience highlights the importance of technological advancements in diabetes management and the possibility of achieving high levels of athletic performance despite the challenges of diabetes.

Diet Plan for Diabetic Athletes

Drawing inspiration from these personal accounts and the research findings, the following diet plan is proposed for diabetic athletes:

Note: This is a sample plan and may need to be adjusted based on individual needs and preferences. It is crucial to consult with a registered dietitian or certified diabetes educator to personalize the plan.

Blood Sugar Range: 90-120 mg/dl

Meal	Suggestions
Breakfast (before training)	Oatmeal with berries and nuts, whole-wheat toast with avocado and eggs
Lunch (after training)	Grilled chicken salad with quinoa and mixed greens
Dinner	Salmon with roasted vegetables and brown rice
Snacks	Fruit, yogurt, trail mix

Blood Sugar Range: 120-180 mg/dl

Meal	Suggestions
Breakfast (before training)	Greek yogurt with fruit and granola, whole-wheat toast with peanut butter
Lunch (after training)	Turkey wrap with whole-wheat tortilla and vegetables
Dinner	Lean beef stir-fry with brown rice and mixed vegetables
Snacks	Apple with almond butter, vegetable sticks with hummus

Blood Sugar Range: Above 180 mg/dl

Meal	Suggestions
Breakfast (before training)	Egg white omelet with vegetables, small portion of whole-grain toast
Lunch (after training)	Salad with grilled chicken or fish and a light vinaigrette
Dinner	Chicken breast with steamed vegetables and a small portion of quinoa
Snacks	Small portion of berries, cucumber slices

Important Considerations:

- **Monitor blood glucose levels regularly:** Frequent monitoring is crucial to understand how exercise and food affect blood sugar levels.
- **Adjust insulin doses as needed:** Work with a healthcare professional to adjust insulin doses based on activity levels and blood sugar readings.
- **Stay hydrated:** Drink plenty of fluids throughout the day, especially before, during, and after exercise.
- **Avoid sugary drinks and processed foods:** These can cause rapid spikes in blood sugar levels.
- **Listen to your body:** Pay attention to hunger cues and adjust food intake accordingly.

Conclusion

Managing diabetes as an athlete requires a comprehensive approach that includes careful attention to nutrition, blood sugar monitoring, and insulin management. The proposed diet plan addresses the challenges discussed in this article, such as maintaining blood sugar control during different activity levels and preventing hypoglycemia and hyperglycemia. By following a well-designed diet plan like the one outlined above and working closely with healthcare professionals to personalize their approach, diabetic athletes can achieve optimal performance while maintaining stable blood sugar levels and overall health¹¹. This article provides a framework for understanding the unique needs of diabetic athletes and offers a sample diet plan that can be adapted to individual needs. Further research is needed to explore the long-term effects of different dietary strategies on athletic performance and diabetes management in athletes.

Works cited

1. The Diabetic Athlete - SportsMD, accessed on January 2, 2025, <https://www.sportsmd.com/sports-nutrition/nutrition/diabetic-athlete/>
2. Dietary Recommendations For Diabetic Athletes - Apollo 247, accessed on January 2, 2025, <https://www.apollo247.com/blog/article/dietary-recommendations-for-diabetic-athletes>
3. Meal Plan for Athletes with Diabetes | Jet Fuel Meals, accessed on January 2, 2025,

<https://jetfuelmeals.com/meal-plan-for-athletes-with-diabetes/>

4. Diabetes and Endurance Sports - Academy of Nutrition and Dietetics, accessed on January 2, 2025, <https://www.eatright.org/fitness/sports-and-athletic-performance/advanced/diabetes-and-endurance-sports>

5. Type 1 Diabetes and Exercise - Sports Dietitians Australia (SDA), accessed on January 2, 2025, <https://www.sportsdietitians.com.au/factsheets/community-factsheets/type-1-diabetes-and-exercise/>

6. Clinical Considerations for Athlete Blood Glucose Levels - WholisticMatters, accessed on January 2, 2025, <https://wholisticmatters.com/clinical-considerations-athlete-blood-glucose-levels/>

7. Blood sugar levels in sport - The Pep2Dia® Blog, accessed on January 2, 2025, <https://www.pep2dia.com/blog-pep2dia/human-health/blood-sugar-levels-in-sport/>

8. The effects of acute hyperglycaemia on sports and exercise performance in type 1 diabetes: A systematic review and meta-analysis - PubMed, accessed on January 2, 2025, <https://pubmed.ncbi.nlm.nih.gov/38030440/>

9. 8 of the Best Diet Plans and Programs for Athletes - Healthline, accessed on January 2, 2025, <https://www.healthline.com/nutrition/diets-for-athletes>

10. www.sralab.org, accessed on January 2, 2025, <https://www.sralab.org/sites/default/files/downloads/2024-01/AdaptiveAthletesNutritionPres2023.pdf>

11. Nutrition for the active diabetic | Parkview Health, accessed on January 2, 2025, <https://www.parkview.com/blog/nutrition-for-the-active-diabetic>

12. "Fighting spirit": specific personality traits as one of the key factors for sport championship in type 1 diabetes mellitus - PMC, accessed on January 2, 2025, <https://pmc.ncbi.nlm.nih.gov/articles/PMC7804577/>

13. Strategies to Reduce Hyperglycemia-Related Anxiety in Elite Athletes with Type 1 Diabetes: A Qualitative Analysis | medRxiv, accessed on January 2, 2025, <https://www.medrxiv.org/content/10.1101/2024.10.19.24315806v1.full-text>

14. Management of athletes and active people with diabetes - The American Medical Society for Sports Medicine (AMSSM) scientific statement - Sanofi campus, accessed on January 2, 2025, <https://www.campus.sanofi/qa/science/diabetes/cutting-edge-science/2022/ar/management-of-athletes-and-active-people-with-diabetes>

15. Mark Andrews | Type 1 Diabetes Success Story - UMass Chan Medical School, accessed on January 2, 2025, <https://www.umassmed.edu/dcoe/diabetes-care/success-stories/2020/09/mark-andrews/>

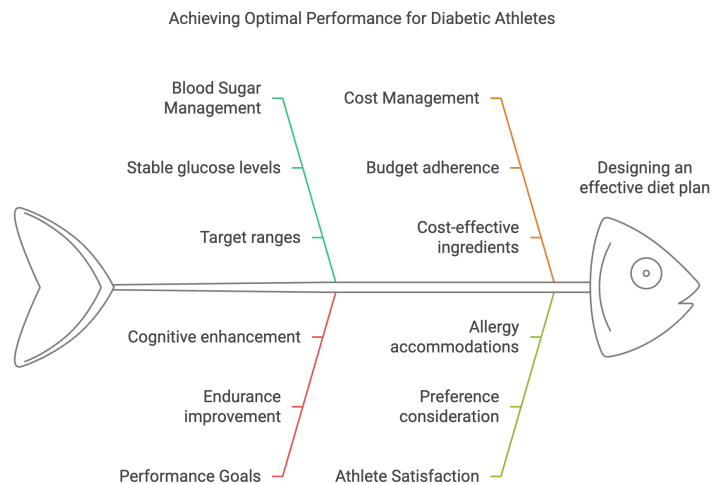
16. Former Professional Baseball Player with Diabetes Was First to Wear an Insulin Pump on Big-League Field | Johns Hopkins Medicine, accessed on January 2, 2025, <https://www.hopkinsmedicine.org/news/articles/2023/04/former-professional-baseball-player-with-diabetes-was-first-to-wear-an-insulin-pump-on-big-league-field>

17. Diabetes and Sports: Managing Your Athlete With Type 1 Diabetes - PMC, accessed on January 2, 2025, <https://pmc.ncbi.nlm.nih.gov/articles/PMC6124849/>

Section B Personalized Project Development Plan

My Learning Goal:

- In my project I will be designing a diet plan for diabetic athletes. This diet plan has unique features such as different meal suggestions for different times and blood sugar ranges in order to optimize the performance of the athletes utilizing my diet plan. Diabetes is a rapidly moving condition which can affect the performance of athletes and influence outcomes to their matches and games. Rapidly changing blood sugar levels going up and down can affect an athlete's training sessions as well. These training sessions need to be executed perfectly in the proper blood sugar ranges in order for the athlete to strengthen their skills and increase their potential. My learning objective is to design a diet plan which caters to different blood sugar ranges such as 90-120 mg/dl, 120-180 mg/dl, etc. Using an adaptive diet will optimize mental and physical potential and output at both training sessions and competitions.
- My diet plan will revolve around my personal experience with Type 1 diabetes. I will be monitoring my blood sugar levels before, during and after my training sessions. My nutritional knowledge built up in the past will also be an important part in developing the final product. This project is close to my heart because, as I am a type 1 diabetic athlete myself, it has always been very difficult to keep my blood glucose level within a good range during the activities that require much intensity. I observed previously during my experiences as a tennis player i tended to go very low very fast despite my skill level due to being diabetic i was unable to compete for my previous school due to my blood sugar instability being considered a liability. My aim is to help diabetic athletes in maintaining stable levels and improving high intensity sports which require stamina, speed and explosive power. To make this objective quantifiable, I will: Measure my own blood sugars before, during and after my training sessions, and tracking which foods during which times and blood sugar ranges work best. The sport I am participating in and using as an example is boxing as it is my main sport and I practice very frequently.
- Blood sugar stability: Accurate continuous glucose monitors being placed onto athletes will make it a little bit easier to accurately track the blood sugar of the participating athletes which will make it easier to maintain a level of 90-180 mg/dl for at least 80% of the time during training and competition, when an inaccuracy is detected it is important to check manually as cgm devices are not 100% accurate 100% of the time.



- Performance Improvement: The Goal of these tweaks in an athlete's nutritional routines should yield close to a 10% increase in endurance and cognitive abilities through the use of pre and post performance measurements, including but not limited to running stamina, strength output, and reaction times, during a 4-week time frame.

What Sparked My Interest in This Goal and Made it Personal:

I have a very heavy interest in this project because I, myself, suffer from Type 1 diabetes. I am a boxer. Tennis used to be my game after I had to temporarily discontinue MMA due to my diagnosis. My blood sugar levels fluctuating during heavy physical exertion has always been one of my biggest challenges in sports. My performance would drop a lot extremely fast due to the fast fluctuations in my blood sugar levels that would cause hypoglycemia episodes courtside, my symptoms are lack of energy and poor reflexes as well as reduction of explosive power. High blood sugar levels can cause an individual to have tight muscles, nausea and lack mental clarity which inhibits an individual from making proper decisions which affect performance. I did extremely well in tennis despite all my troubles managing my blood sugar levels. One thing that came into my mind very recently is proper nutrition would significantly help people like me. The last 3+years of my life, I have been attempting to find the perfect balance in my diet in order to keep my sugar level in the correct level and at the same time have exceptional outcomes. My research paper will develop a course of action regarding nutrition that will aid diabetic athletes in overcoming the same issues I faced which will help them perform better in their own sport.

Connecting Global context to my goal:

The global context that is the base of my project is "Identities and Relationships". This concept is appropriate considering the connection between physical health and personal identity. In this specific scenario diabetic athletes are identified by how well they manage their health and their performance in the sport they are participating in. Diabetes is a condition that can greatly affect the potential of an athlete during training and competition. Using my previously gained knowledge of nutrition and research into blood sugar levels I am to establish a diet which will help diabetic athletes improve sports performance while keeping them healthy. This project also voices the increase in Type 1 diabetic athletes and the lack of diet plans that would push them further towards success in their sport as well as keeping their blood glucose stable. While making this project, I will aim to help other athletes, not just expand my knowledge about sport nutrition and effective blood sugar management methods.

My prior experience and skills:

I have previous experience in the topics of fitness and nutrition, mainly bodybuilding and a diet to keep a healthy weight with a good muscle to weight ratio as I was originally "skinny fat", but I improved my body composition by exercising regularly and eating healthy food with lots of protein. With my improved body physique, my performance in sports increased but maintaining control of my blood sugars was a different task as a diabetic.

I will create my nutrition plan by using sports nutrition, GI-glycemic index, as well the effect of carbohydrates on a diabetic individual's blood sugar as well as a balance of macronutrients for better athletic performance. I also need to learn about how nutrition affects diabetic athletes' blood sugar as well as the new technologies and methods of monitoring blood sugar and delivering insulin.

My product goal:

My study will be focused around designing a diet plan for each individual's needs based on their glucose level at certain meals and snacks. By doing so it can ensure a higher chance that diabetic athletes will be performing at their best level, both mentally and physically. The nutrition plan will also give personalized meal and snack options for all blood sugar values throughout the meals and snacks planned to be consumed during the day, allowing an athlete to select foods to help with caloric, carb and protein needs to excel in high-intensity sports. My goal for the end of the project is to create a functional tool that a diabetic athlete can utilize to enhance their performance through the means of nutrition, and have stable glucose levels. This will be established with the help of real-life data, such as my own glucose readings from my own cgm, scientific research relating to the management of blood sugar levels in diabetic individuals and sports nutrition.

Diet Plan Example (Mock Table):

The table below displays the different meals that can be consumed for each blood sugar range at every meal time and snack time. This is just a hypothesis, the table will be improved as I research more pertaining to the area of interest and as I increase my knowledge in nutrition regarding diabetes and sports specifically

	Breakfast	Lunch	Dinner	Snack (Pre game/ training)	Snack (Post game/ training)
90 - 120 mg/dl	A meal high in carbs, protein and fruits can be included	A meal high in carbs, protein and fruits can be included	A meal high in carbs, protein, fat and fruits can be included	A high amount of simple carbs and complex carbs protein can be ignored if not included in carb sources	High simple carbs, moderate complex carbs can be okay as well, protein, fruits, fat and fiber
120 - 180 mg/dl	A meal high in carbs, protein and fruits(when towards the upper end of this criteria carbs should be reduced)	A meal high in carbs, protein and fruits(when towards the upper end of this criteria carbs should be reduced)	A meal high in carbs, fat, protein and fruits(when towards the upper end of this criteria carbs should be reduced)	A high amount of simple carbs and complex carbs protein can be ignored if not included in carb sources	Moderate simple carbs, high complex carbs, high protein, high fiber, fat and fruits
180 - 250 mg/dl	A meal with a moderate amount of carbs with more fiber and protein	A meal with a moderate amount of carbs with more fiber and protein	A meal with a moderate amount of carbs with more fiber, protein and fat	Moderate amount of simple carbs a high amount of complex carbs along with fiber	Low simple carbs, high complex carbs, high protein, high fiber and fat
250 - 320 mg/dl	A meal lower in carbs with	A meal lower in carbs with	A meal lower in carbs with	Low simple carbs, moderate	Little to no simple carbs,

	higher protein and fiber	higher protein and fiber	higher protein, fat and fiber	complex carbs and fiber	moderate complex carbs, high protein, high fiber, high fat
320 - 400< mg/dl	No carbs should be consumed, protein and fiber should be of importance	No carbs should be consumed, protein and fiber should be of importance	No carbs should be consumed, protein, fiber and fat should be of importance	Little to no simple carbs with low complex carbs and moderate amount of fiber	Little to no simple carbs, moderate complex carbs, high protein, high fiber, high fat

Success criteria:

- I will assess my progress toward making this project a success by following the SMART goal criteria shown below:
- Grocery food cost:
- Specific: Purchase ingredients to make healthy meals for less than \$100-150 per week.
- Measurable: Keep the grocery bill in check and adjust meal selection to keep within budget.
- Attainable: Plan meals in advance and minimize clean ingredients that are expensive.
- Time-frame: Complete grocery shopping and meal pre in 1 to 2 weeks.
- Blood Sugar Management:
- Specific: Keep the blood sugar between 90-180 mg/dl before and after meals. For 90% of all training days. This is a specific goal because it involves glucose intake and monitoring, which is very important in blood sugar levels throughout the training process.
- Measurable: Log of before- and after-meal glucose values with diet adjustment as needed.
- Time-bound: Glucose levels should be maintained stable within target for 4 weeks.
- Athlete Performance:
- Specific: Improve performance and cognitive function during training sessions and competitive settings.
- Reasurable: Running stamina and reaction times will be compared before and after the diet plan for a month.
- Time-bound: Achieve measurable improvements within 4 weeks.
- Athlete Specific: The diet should have the athletes satisfied enough to continue with it.
- Measurable: Feedback will be taken every week, and the plan will be changed according to the athlete's choices.
- Time-bound: 2-3 athletes for 1 month.
- Safety Particular: Diet plan should consider allergies and dietary restrictions.
- Measurable: Check the dietary preference of the athletes before starting the nutrition plan.
- Time-bound: Any safety concern should be communicated immediately, and changes in the diet plan should be accordingly changed.

	Success Criteria	Testing method
Cost of groceries	The goal is to purchase clean ingredients which are healthy for under 150\$ USD per week.	Develop the diet plan first and then go shopping for the ingredients for cooking.
Blood sugar management	The goal is within 2 hours after eating blood sugar should be below 180 and above 90.	Consume the meal and then give insulin or take a tablet (Type 2), then record observations, repeat for 1 month
Performance	The athlete's physical performance and cognitive functions should be maintained at a good level during training and competition.	Eat a snack before training or competition based on the blood sugar and the diet plan, then compare the current performance with their past performance.
Athlete's preferences/ Feedback	The athlete should be happy about the diet plan and should want to eat the food in the diet rather than eating unhealthy items due to a boring and repetitive diet.	Create different types of meals and switch them out and collect feedback from each athlete in order to tweak the diet to their needs.
Safety	Take into consideration allergies and dietary needs in order to prevent the diet from creating any conflicting issues.	Being educated about problems the client has mentioned and creating a diet plan geared towards their sports improvement while taking into consideration what they can and can not eat.
Longevity	Athletes should not deviate from the diet plan and should continue using it as it is healthy.	Make sure the meals don't get boring and repetitive and switch out foods every few weeks.

Criteria C - Plan & Project Details

Approaches to Learning Skills (Learning Goal) Research

In order to achieve my goal of making a diet-plan for diabetic athletes, I first have to research which foods are good for certain blood sugar levels.

This is a significant ATVL Skill needed as not all foods can be used to help increase performance output in

diabetic athletes while maintaining a healthy blood sugar during training and competitions. In order to start the research process my first step was to make a simple google search regarding the criteria of how blood sugar should be affected after eating food at every single blood sugar

range mentioned in the table above. Upon curating a list of possible foods, i will then eat the specifics food arranged for the specific blood sugar range when i am in the blood sugar range and then record how my body reacts and then use process of elimination to select 3 foods per blood sugar range, 3 foods means a new food for every meal for a whole quarter of the year (3 months). Based on which I have created the UI app in python to help with meal plans for

Development of Diet Plan for Diabetic Athletes



Investigate Foods

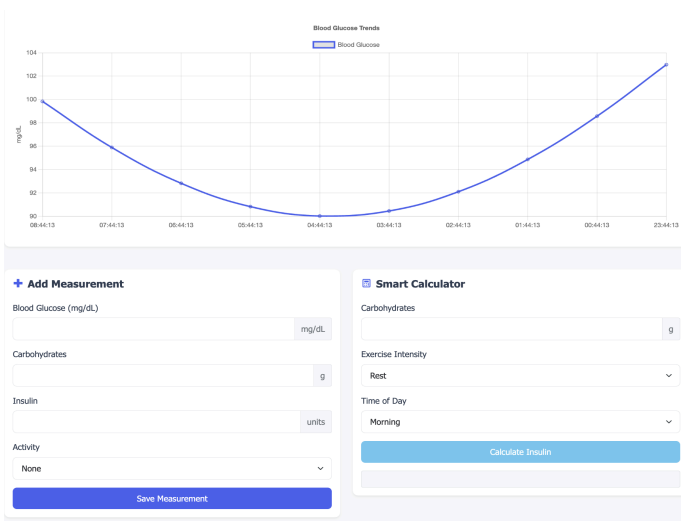
Researching suitable foods for blood sugar stability

Test Foods

Conducting personal trials to measure blood sugar impact

Select Foods

Choosing three foods per range for variety



Meal Planner

Meal Type Breakfast

Target Carbs

Generate Meal Plan

Workout Planner

Workout Type Cardio

Duration (minutes)

Intensity Level Low

Generate Workout Plan

Recent Measurements

Time	Glucose	Carbs	Insulin	Activity
03/01/2025, 08:44:13	99.83441845001484 mg/dL	0g	0u	-
03/01/2025, 07:44:13	95.88919348859216 mg/dL	0g	0u	-
03/01/2025, 06:44:13	92.82131013146815 mg/dL	0g	0u	-

Monitoring levels.

Created the App found at : <https://diabetetracker-pro.vercel.app/>

Criteria C: Reflection for "Meal Plan for Diabetic Athletes"

1. Knowledgeable:

Through this project, I deepened my understanding of diabetes management, sports nutrition, and their intersection. I expanded my knowledge of the glycemic index, macronutrient balance, and the role of continuous glucose monitoring in athletic performance. This learning empowered me to design a meal plan grounded in science and practical application.

2. Thinker:

I applied critical thinking to address the complex challenge of fluctuating blood sugar levels during high-intensity sports. I evaluated and analyzed dietary patterns, experimented with meal compositions, and refined my solutions based on real-time data from glucose monitoring devices.

3. Inquirer:

Driven by curiosity, I researched extensively to uncover foods that align with specific blood sugar ranges while enhancing athletic performance. I explored diverse nutritional strategies and continually asked questions to ensure my plan was effective and adaptable for other athletes.

4. Reflective:

Throughout the project, I evaluated my progress by monitoring blood sugar trends, athletic performance, and feedback from test scenarios. Reflection allowed me to understand what worked, identify areas for improvement, and adapt my methods to achieve better outcomes.

5. Open-Minded:

I embraced diverse perspectives, incorporating feedback from athletes with different dietary preferences and needs. This inclusivity ensured my plan was adaptable to various cultural and personal dietary habits.

6. Communicator:

I effectively conveyed my findings through detailed documentation, mock meal plans, and presentations. By using clear language and visual aids, I made my research accessible and actionable for diabetic athletes and their coaches.

7. Balanced:

The project emphasized the importance of maintaining a balanced approach to nutrition, exercise, and glucose stability. This principle guided my methodology, ensuring the meal plan was practical and sustainable for long-term use.

8. Risk-Taker:

I took the initiative to experiment with meal combinations and pre- and post-training snacks, knowing the risks of fluctuating glucose levels. By carefully monitoring outcomes, I demonstrated courage and responsibility in pursuing innovation.

9. Principled:

Integrity was central to my work. I adhered to ethical practices by prioritizing safety, considering dietary restrictions, and validating my recommendations through evidence and real-life trials.

10. Caring:

This project was motivated by empathy for diabetic athletes who struggle with similar challenges. My goal was to create a meaningful resource that could improve their performance and quality of life, reflecting a strong sense of social responsibility.

11. Resilient:

Overcoming setbacks, such as technical challenges with continuous glucose monitoring or unexpected blood sugar fluctuations, required persistence. I stayed focused on my objectives and adapted my approach to meet the project's goals.

12. Creativity and Innovation:

The personalized nature of the meal plan demonstrated creative thinking, incorporating innovative solutions such as adapting snacks to real-time glucose readings and introducing variety to maintain athlete adherence.

By embodying these profiles and attitudes, I was able to create a comprehensive, thoughtful, and impactful meal plan tailored to the unique needs of diabetic athletes. This reflection highlights the growth, learning, and practical application achieved through this project.

