Contents

Data overview

	Customer ID	Gender	Age	Hours at Gym (per week)	Fitness Goal	Calorie Intake	Dietary Preferences	Average Spend per Meal Order	Gym Membership Length (years)
0	221958	Female	27	7.3	Build muscle	NaN	Whole foods	67.15	4
1	771155	Female	24	6.2	Endurance training	2173.0	Whole foods	52.94	4
2	231932	Male	22	7.4	Fat loss	1752.0	Whole foods	38.13	2
3	465838	Female	23	6.0	Build muscle	2884.0	High protein	61.44	0
4	359178	Female	18	9.3	Build muscle	2559.0	Whole foods	69.78	5

1000 rows x 8 columns

- **Customer ID**: Unique ID for each gym customer.
- **Gender**: Customer's gender (e.g., Male, Female, Non-binary).
- **Age**: Customer's age in years.
- **Hours at Gym** (per week): Average weekly gym hours.
- **Fitness Goal**: Primary fitness objective (e.g., Weight Loss, Muscle Gain).
- **Calorie Intake**: Average daily calories consumed.
- **Dietary Preferences**: Dietary choices or restrictions (e.g., Vegan, Gluten-Free).
- **Average Spend per Meal Order**: Typical spend per meal, reflecting dietary habits.
- **Gym Membership Length** (years): Duration of gym membership in years.

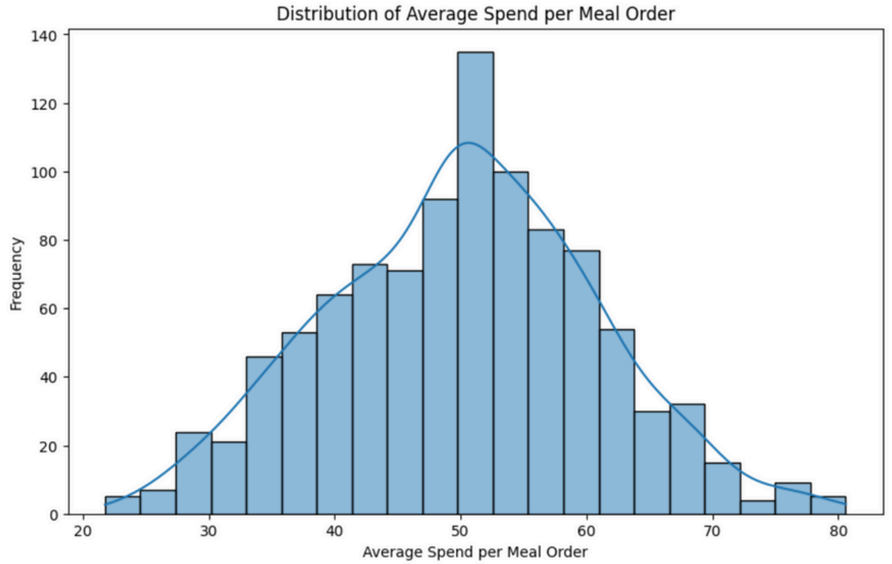
Key points: The datasets represent the same individuals

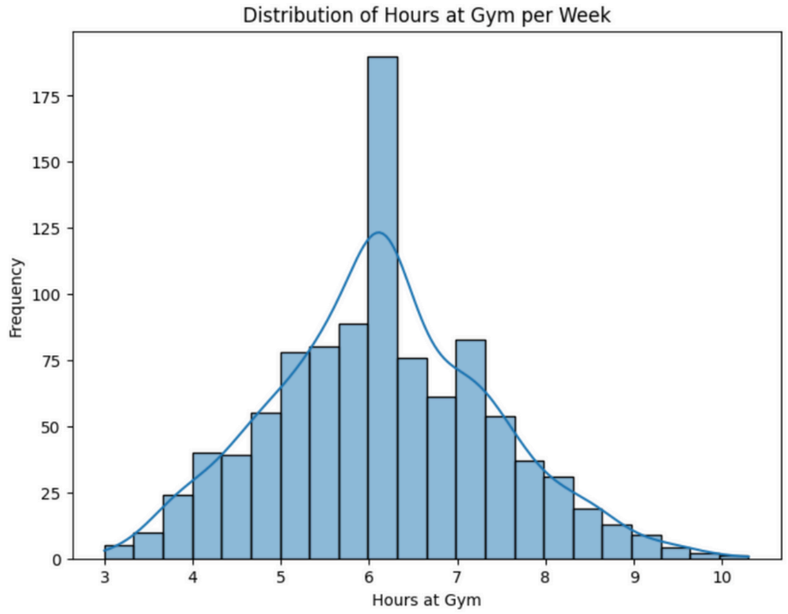
Handling Errors

Created a function that chooses the best way to summarize data (mean or median) by looking at how the data in each column is distributed (skewness).

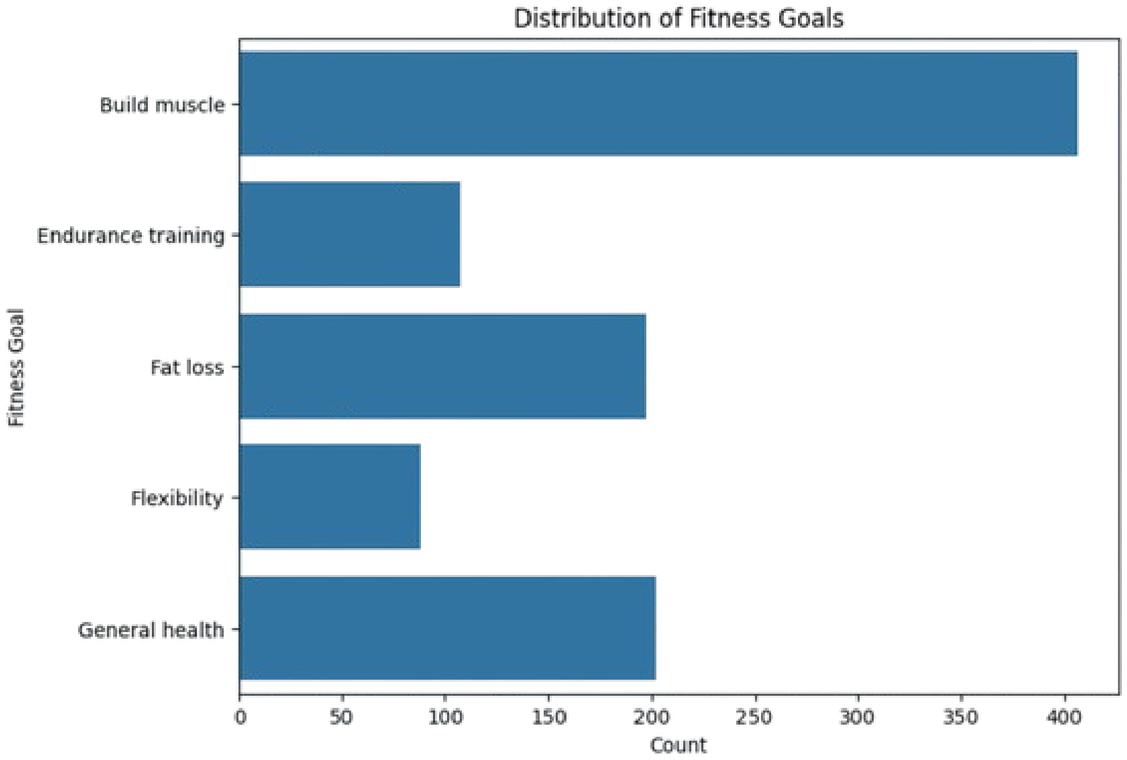
For qualitative data, we use ‘Unknown’ to clearly indicate missing or unavailable information, maintaining consistency across the dataset.

Symmetric Distributions





SUMMARY OF KEY FINDINGS

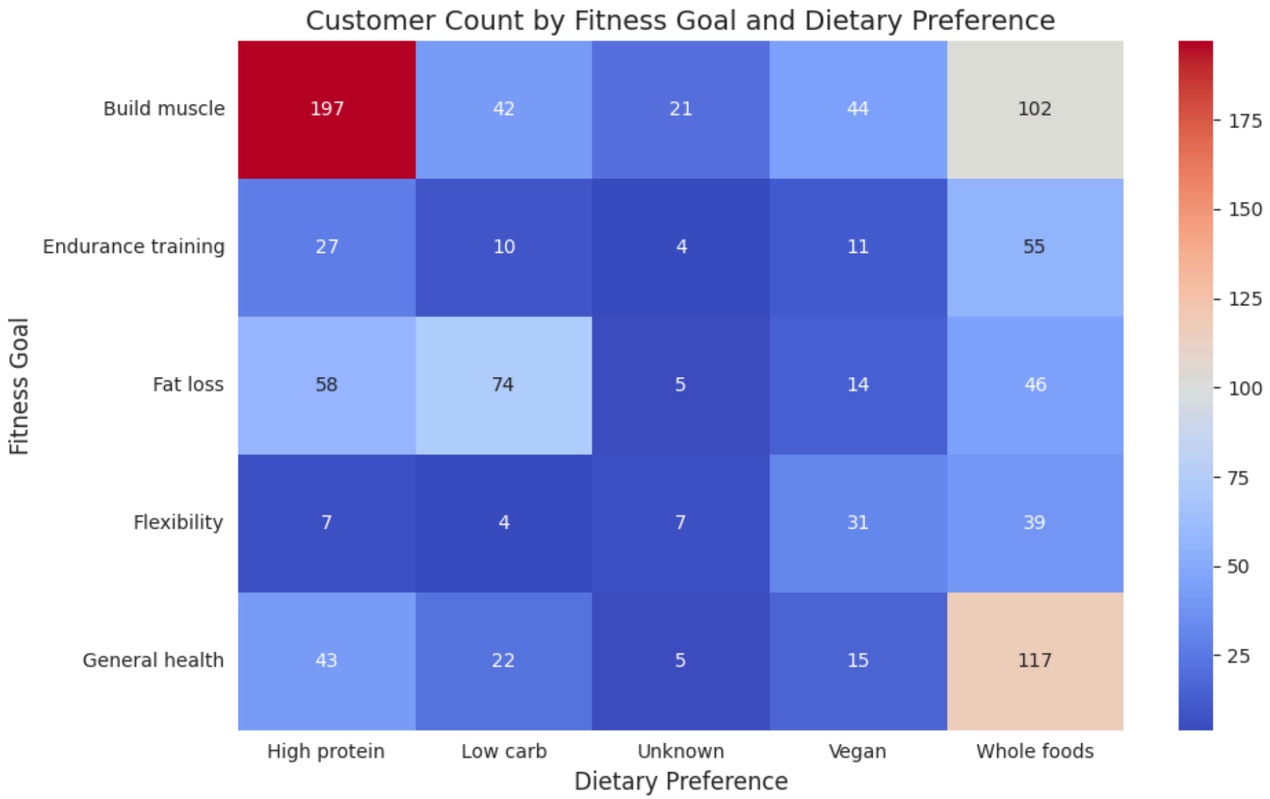


Most of our customers want to **build muscle**, **improve health**, and **losing weight**.

Combined, they make up **more than 80%** of our customers.

The focus on muscle building and fat loss indicates a customer base highly engaged in achieving fitness outcomes which often requires **specialized nutrition**

SUMMARY OF KEY FINDINGS



The majority of our customers can be classified into **3 subgroups**:

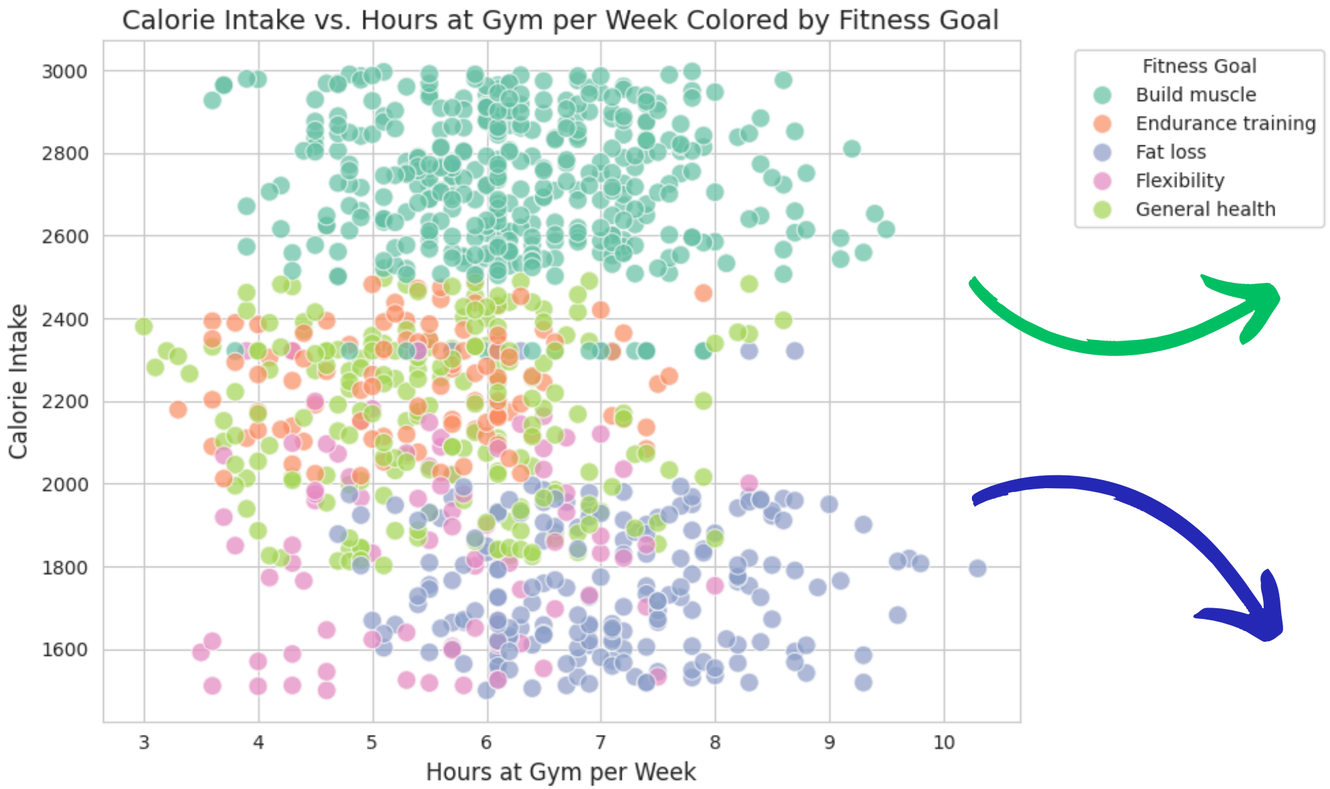
Customers aiming to **build muscle** with a **high-protein diet**

Customers aiming to **build muscle** with a **whole foods diet**

Customers focused on **general health** follows a **whole foods diet**

Interesting point: Customers focused on **fat loss** are split on dietary preference.

SUMMARY OF KEY FINDINGS

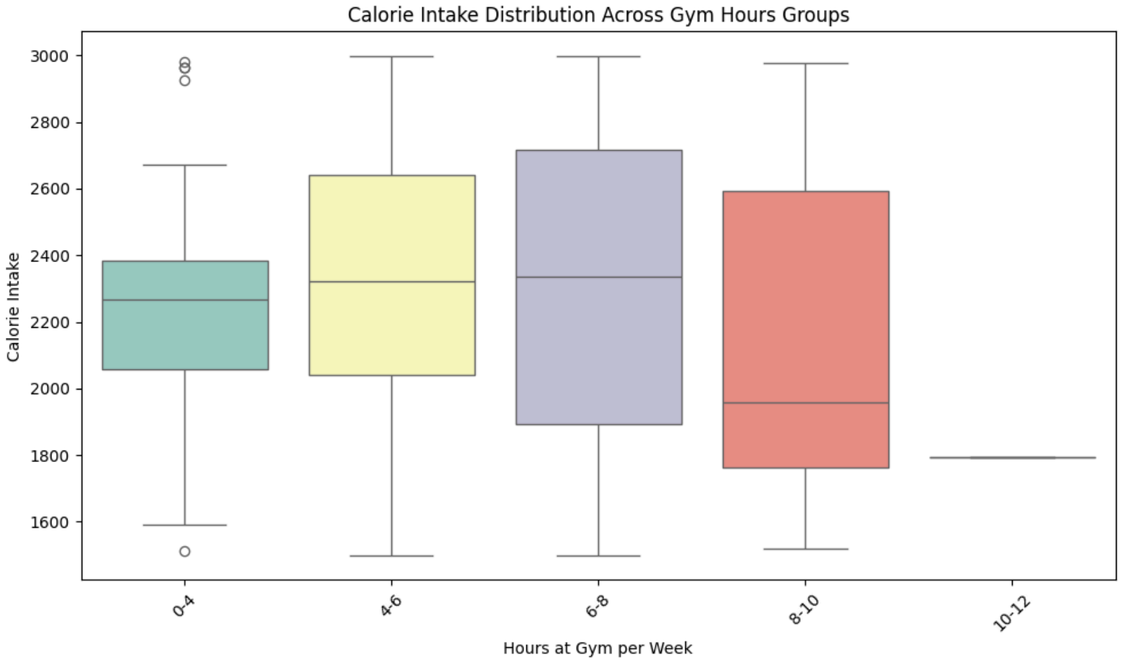


Customers focused on **Build Muscle** generally have **higher** calorie intakes

Naturally, customers focused on **Fat loss** have **lower** calorie intakes

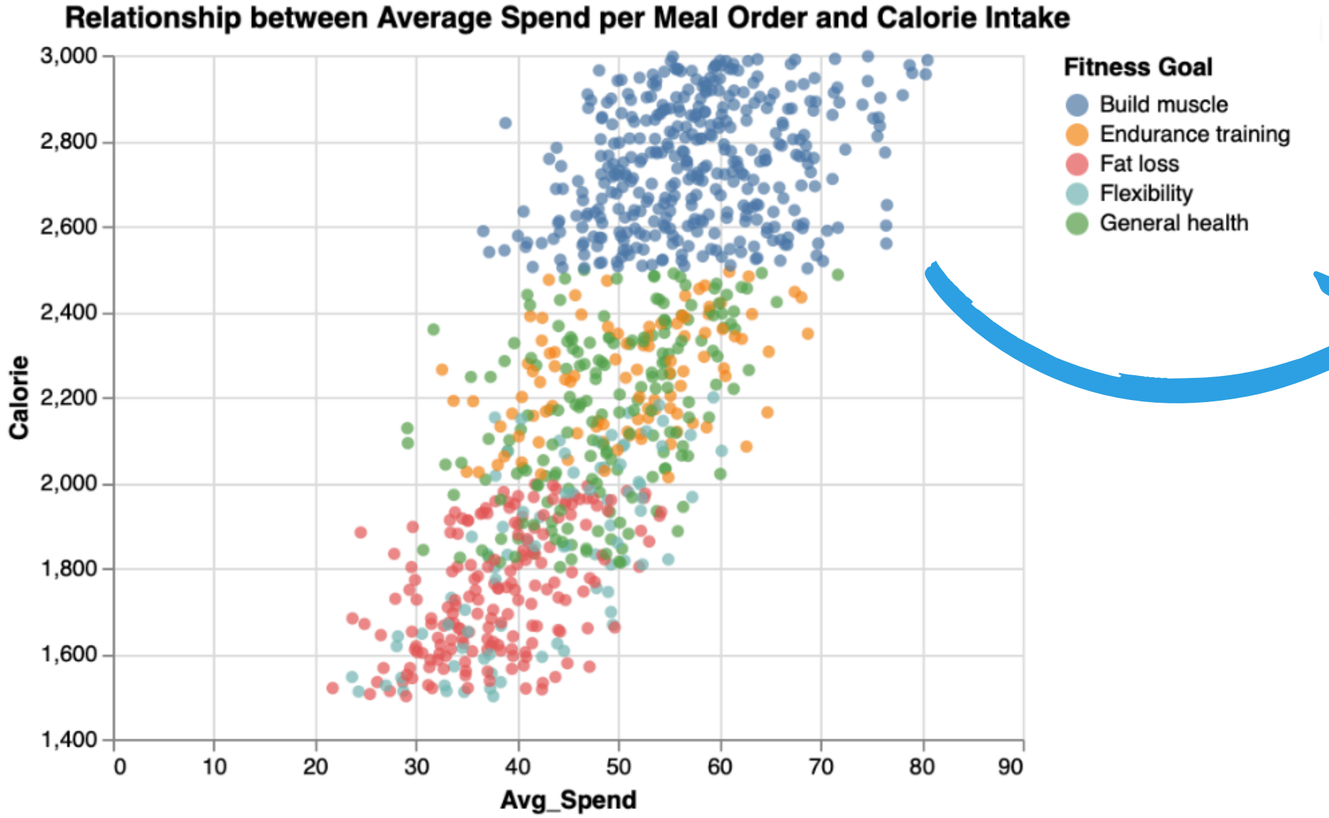
Both tend to **spend more hours** at the gym and **track their calories catiously**

SUMMARY OF KEY FINDINGS



In fact, the majority of customers, with 4-8 hours of gym time per week, have a particularly **wide calorie intak**e range, indicating **diverse nutritional needs**

SUMMARY OF KEY FINDINGS



The biggest subgroup, customers who want to **build muscle**, are **spending more on dietary needs**

This entails any innovation that **saves them money**, enhances **customer loyalty** and **brand value**📈

Status quo

The erosion of **brand loyalty**, especially among younger consumers **seeking flexibility** and **innovation**, has made it difficult for FlexField to grow.

Key Question

Who should we partner with and how can we create **compelling joint products** that **attracts new customers**, **enhance loyalty**, and **revitalizes the brand**?

Why Chef’s Meal Over Supplements?

The trend in gym supplement industry: there is a growing focus on **clean-label products**, with consumers seeking supplements **free of artificial ingredients** and those that use natural sweeteners or plant-based proteins.

There is always a **real-food** counterpart to **any artificial supplement**

FlexField’s value proposition of accessible, quality wellness aligns with Chef’s Meal’s capability to deliver convenient, calorie-specific meal plans

Understanding Our Customer Base

Customers fall into major categories, such as high-protein, whole foods, and balanced diets — Chef's Meal's flexibility aligns well with these varied needs.

Supplement companies primarily target high-protein needs for muscle-building members (highlighted in **red**)

Chef's Meal can cater to high protein option (**red** area) whole foods, as well as low-carb, and balanced options (**green** areas)

Why Chef’s Meal Over Apparel Companies?

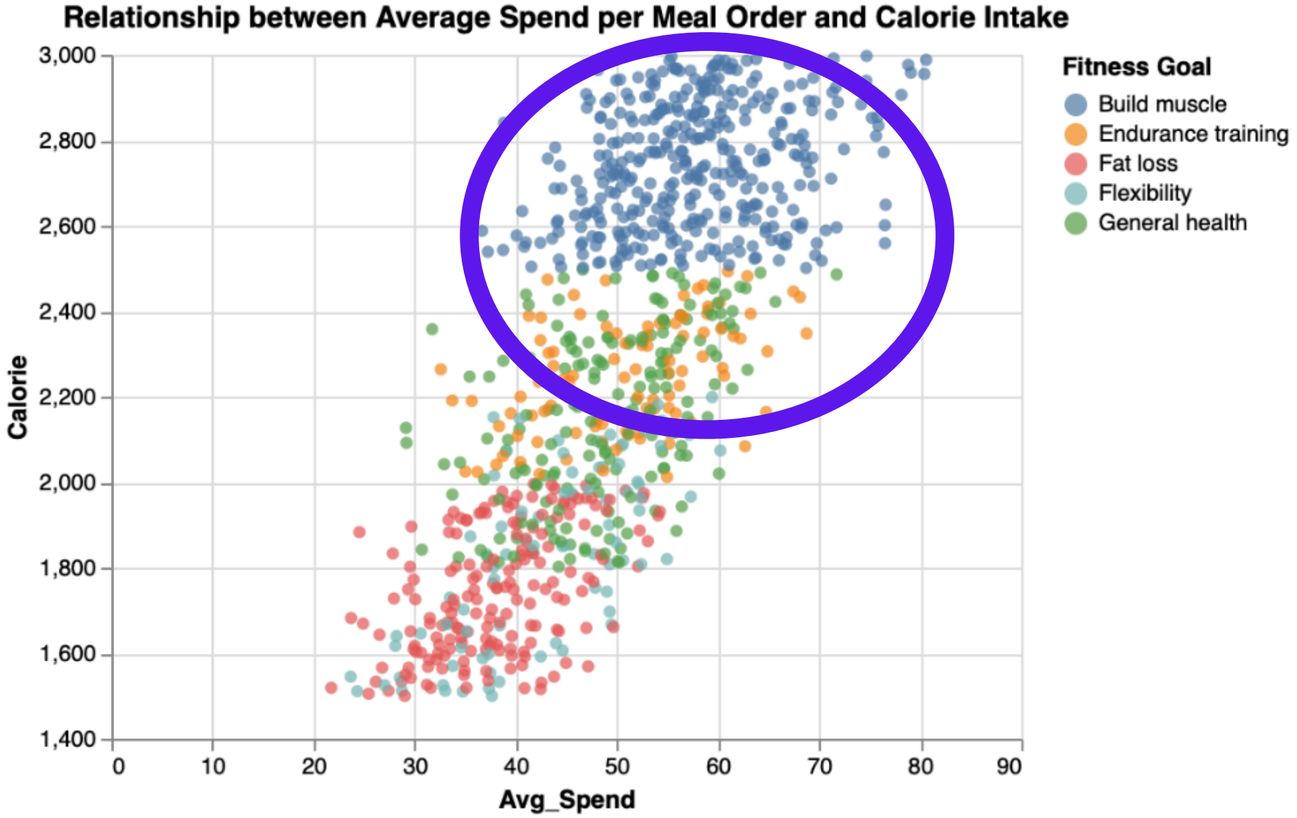
The trend in fitness apparel: While performance and athleisure apparel is popular, it primarily supports **the external aspect of fitness** rather than **internal wellness** and nutrition.

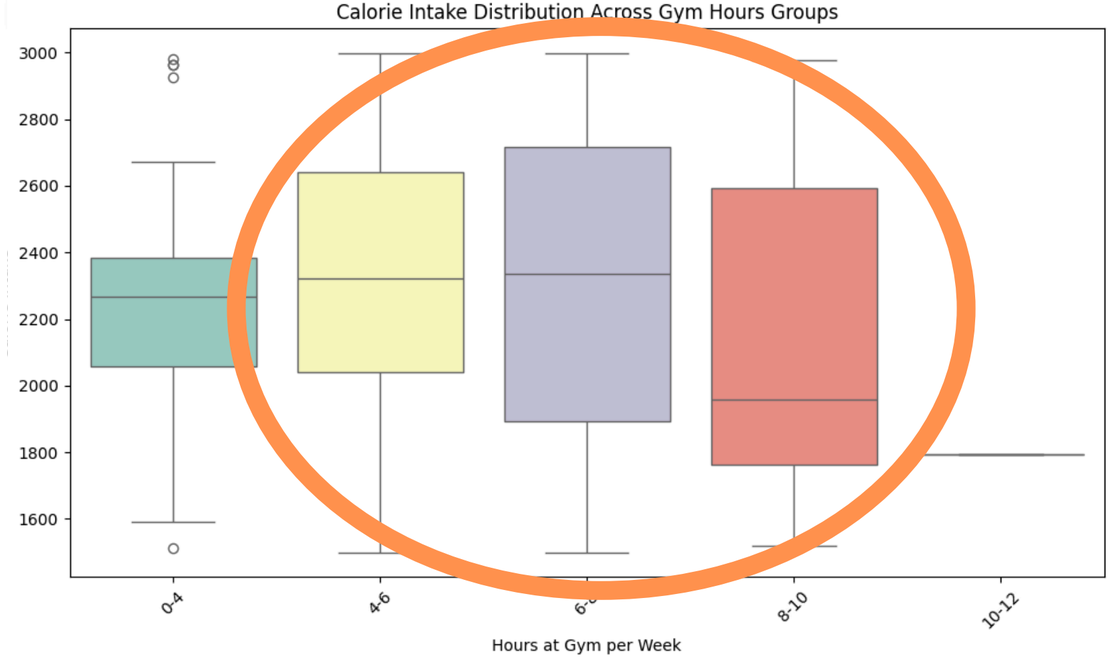
Apparel provides style and comfort, but it doesn’t directly enhance t**he outcomes of fitness goals** like **muscle building, fat loss, or health improvement.**

FlexField’s holistic wellness focus aligns better with Chef’s Meal, as it provides nutrition solutions that support fitness results from within, delivering measurable value to customers’ health and wellness journeys.

Understanding Our Customer Base

The partnership will also set the foundation for **high-paying ongoing customers** and **nutrition-conscious consumers** who have **diverse calorie intake** & **spend more time** in the gym.





Chef’s Meal as a Loyalty and Brand Differentiation Tool

Name one gym that has “food court” in it?

A unique food partnership **differentiates** FlexField in a crowded market, **enhancing brand value** and providing a personalized experience that **reinforces customer loyalty and brings new customers**

Joint-Product & Services

GymGems💎

gain redeemable points based on the time spent in the gym, online fitness classes and training sessions

AdaptEats🍔

A meal suggestion based on the customer's workout goal and amount

ReviveBite👨‍🍳

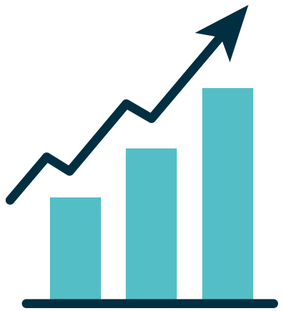
Order meals before workout, eat them when you're pumped

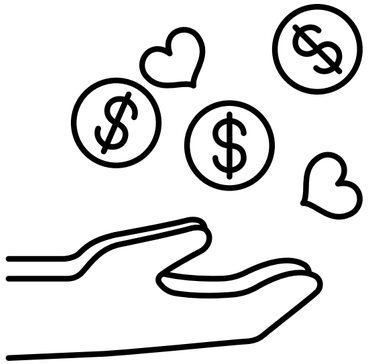
The Feast🍱

Costco-like Food Court
In specific locations that offers selected few high protein meals foods at discounted price

GymGems💎

- Customers can gain points based on the time spent in gym, online fitness classes and training sessions
- Points can be used to gain free meals/discounts when purchasing food products from Chef's Meal





- Rewards based on commitment, increases incentive
- Joins the trend of reward points, popular among food retail industry

AdaptEats🍔

- Customers can track their workout progress and calories spent
- Generates a meal suggestion based on customer’s workout goal and amount, allowing customization on proportions
- Quick order to Chefs Meal ready-made meal

- Helpful to workout beginners, who are not experienced in meal preparation, increases appeal for beginners
- Improves FlexField online functionality, demonstrates innovation

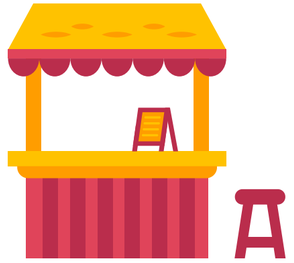
ReviveBite

- Customers can order their Chefs Meal before workout, specifying when the meal will be delivered
- Customers can pick-up their meal after workout

- Most customers gets very hungry after workout
- High convenience, time-saving
- Great for young customers who are busy and have no time preparing meals

Launch seasonal fitness challenges (e.g., “New Year, New You” or “Summer Shred”) with Chef’s Meal providing custom meal kits and dietary support tailored to the challenge.

The Feast



- Inspired by Costco Food Court
- In specific locations, open a mini food court that offers selected few high protein meals / whole foods at very low price

- Increases customer’s incentive to attend physical gyms
- High affordability and convenience, catering to modern customer’s needs
- Membership exclusive, improve member loyalty

The meals are designed for energy, recovery, or endurance, available at FlexField locations or through the app.

Targets

Customer Loyalty

More member **renewals**
Positive **Feedbacks**
Longer Average Gym Membership Length

Customer Engagement

More **active** members attending physical gym
Higher **participation** rates in online workout sessions

Revenue Growth

Increased average **revenue** per user
Higher **sales** in food products in Chefs Meal

Brand Image

Improved brand sentiment
Higher prescence in social media

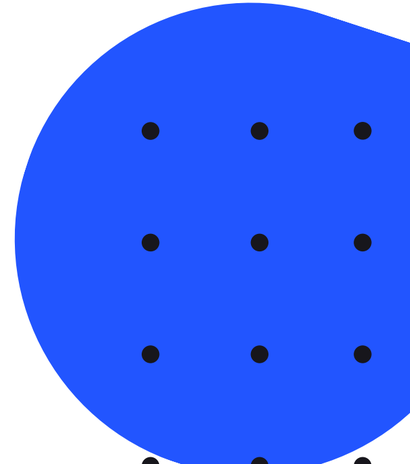
Brand Perception and Trust

Quality Control

Cosistent high quality meals
Food sourced from ethnic, trusted background

Sustainability and Ethics

Use sustainable food containers and eco-friendly packaging



Technology and Fitness Services

Both GymGems and AdaptEats require a strong technological foundation.

Machine Learning can be used to improve fitness services

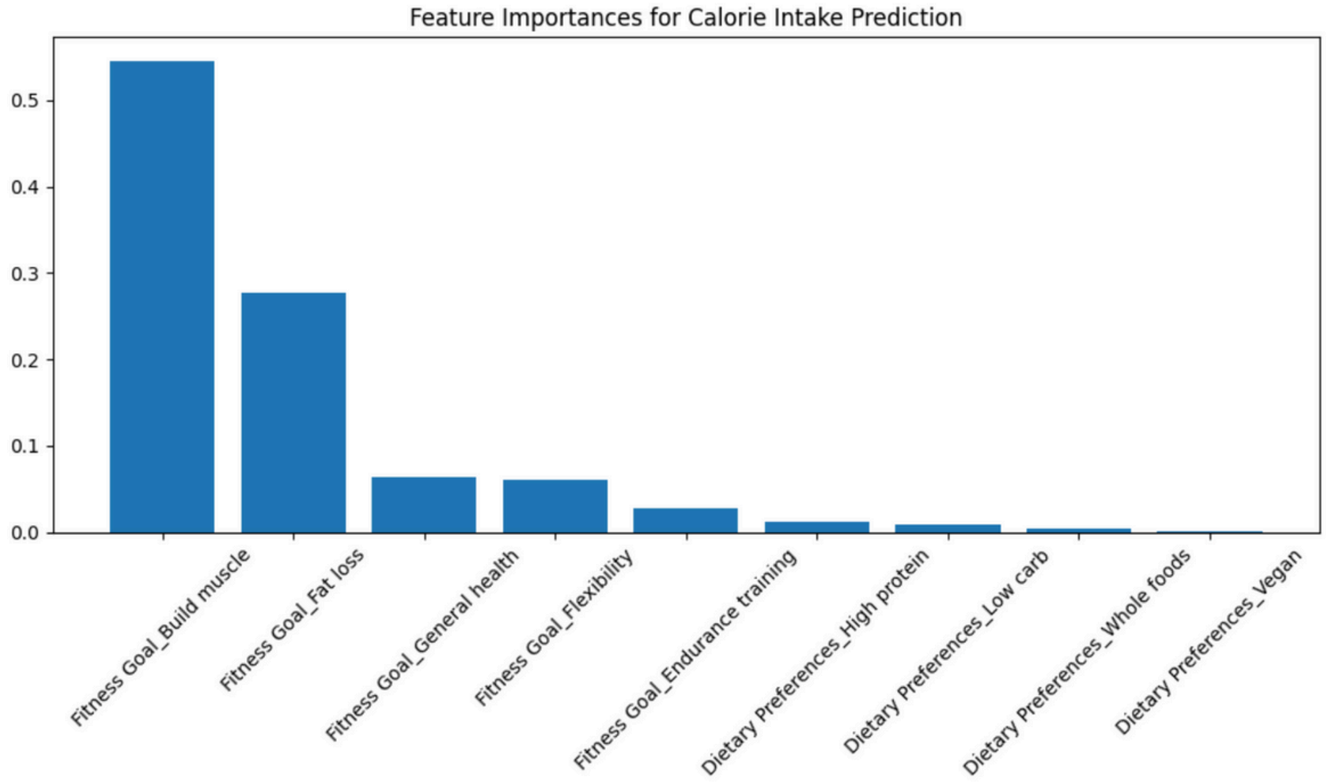
Technology and Fitness Services

Uses for Machine Learning

- Predict Customer's calories intake based on workout choice, ...
- Suggest popular meal / improve personalization on meal recommendation based on data collected
- Data Analytics to evaluate effectiveness of fitness services and enhance services accordingly
- Chefs Meal is struggling to balance convenience, customization and cost, implementing data analytics and machine learning will be helpful in achieving the balance

Machine Learning Prototype

- Used the columns ‘Fitness Goal’ and ‘Dietary Preferences’ as the features
- Achieved RMSE: **169.69** on Test Set.
-
- Feature Importance for the model:



Select our Target (y) and Explanatory Variables (X) and Split the Dataset for Training and Testing

```
meal_df = chefsmeal[['Calorie Intake', 'Dietary Preferences', 'Fitness Goal', 'Hours at Gym (per week)']]
meal_df = meal_df.dropna(subset=['Calorie Intake', 'Dietary Preferences', 'Fitness Goal', 'Hours at Gym (per week)'])
# Separate features (X) and target variable (y)
X = meal_df[['Dietary Preferences', 'Fitness Goal', 'Hours at Gym (per week)']]
y = meal_df['Calorie Intake']

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

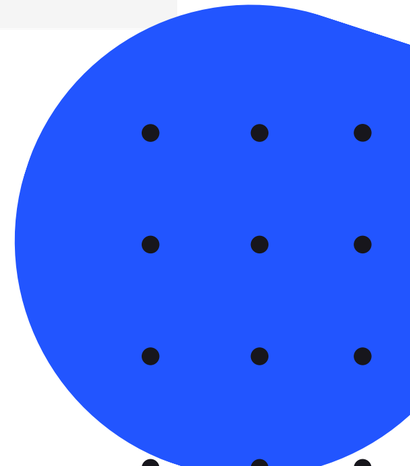
Create Preprocessor to Scale and Convert All Variables and Remove Bias

```
# Create a column transformer to handle categorical features
categorical_features = ['Dietary Preferences', 'Fitness Goal']
numerical_features = ['Hours at Gym (per week)']

preprocessor = ColumnTransformer(
    transformers=[
        ('cat', OneHotEncoder(handle_unknown='ignore'), categorical_features),
        ('num', StandardScaler(), numerical_features)
    ],
    remainder='passthrough'
)
```

Conduct Cross Validation

```python
from sklearn.pipeline import Pipeline, make_pipeline
# Create a pipeline with the preprocessor and linear regression
pipeline = make_pipeline(preprocessor, LinearRegression())

# Perform cross-validation
cv_scores = cross_val_score(pipeline, X_train, y_train, cv=5, scoring='neg_mean_squared_error')

# Calculate RMSE
rmse_scores = np.sqrt(-cv_scores)

# Print the average RMSE across folds
print("Average RMSE across 5 folds:", rmse_scores.mean())
```

```
Average RMSE across 5 folds: 164.1510917047089
```

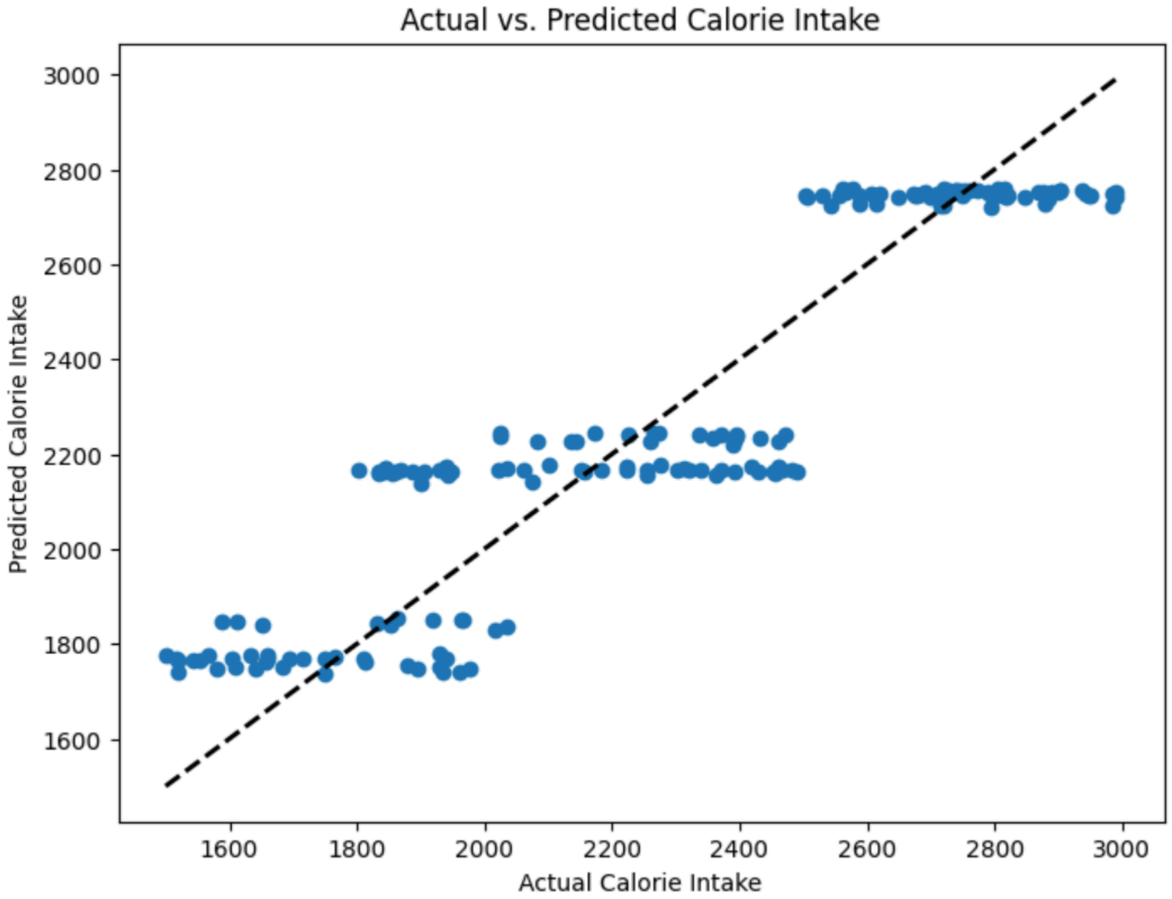


Evaluate our model in test set and return it’s RMSE

```
# Fit the pipeline on the entire training data
pipeline.fit(X_train, y_train)

# Make predictions on the test set
y_pred = pipeline.predict(X_test)

# Calculate RMSE on the test set
rmse = np.sqrt(mean_squared_error(y_test, y_pred))
print("RMSE on test set:", rmse)

# Plot the predicted vs. actual values
plt.figure(figsize=(8, 6))
plt.scatter(y_test, y_pred)
plt.xlabel("Actual Calorie Intake")
plt.ylabel("Predicted Calorie Intake")
plt.title("Actual vs. Predicted Calorie Intake")

# Draw the x=y line
plt.plot([y_test.min(), y_test.max()], [y_test.min(), y_test.max()], 'k--', lw=2)

plt.show()
```

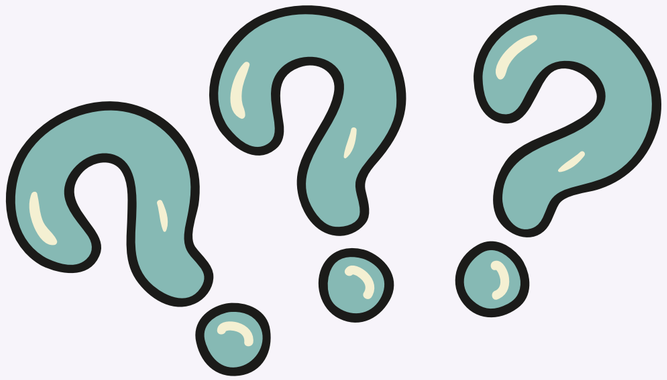
```
RMSE on test set: 169.69457858163884
```

Actual vs. Prediction



- The model is currently inaccurate, as the correlation between workout hours, dietary preferences against calorie intake is not high
- However, as we receive more data from new products (ex. calories burnt, meal preferences), the model's accuracy can be improved

Thank You!



QNA