In [1]:

```
# Import necessary libraries
import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
```

In [2]:

```
df=pd.read_csv("Probiotics _Teja.csv")
```

In [3]:

```
# Display basic information about the dataset
print(df.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10 entries, 0 to 9
Data columns (total 13 columns):
 #   Column             Non-Null Count  Dtype 
---  ------             --------------  ----- 
 0   Company            10 non-null     object
 1   Website            10 non-null     object
 2   Relevant           10 non-null     object
 3   Category           10 non-null     object
 4   Manufacturer       10 non-null     object
 5   Brand              10 non-null     object
 6   F&B                10 non-null     object
 7   Probiotics         10 non-null     object
 8   Fortification      10 non-null     object
 9   Gut Health         10 non-null     object
 10  Womens Health      10 non-null     object
 11  Cognitive Health   10 non-null     object
 12  Distribution       10 non-null     object
dtypes: object(13)
memory usage: 1.1+ KB
None
```

In [4]:

```
# Display summary statistics
print(df.describe())
```

```
        Company                Website Relevant Category Manufacturer Brand
\
count        10                     10       10       10           10    10
unique       10                     10        2        2            1     2
top     Nestle   http://www.nestle.com (http://www.nestle.com)      Yes
F&B          Yes   Yes
freq          1                      1        9        6           10     9

        F&B Probiotics Fortification Gut Health Womens Health  \
count    10         10            10         10            10
unique    2          2             1          2             2
top     Yes        Yes           Yes        Yes           Yes
freq      7          9            10          9             7

       Cognitive Health Distribution
count                10           10
unique                2            1
top                 Yes         Yes
freq                  5           10
```

In [5]:

```
# Check for missing values
print(df.isnull().sum())
```

```
Company             0
Website             0
Relevant            0
Category            0
Manufacturer        0
Brand               0
F&B                 0
Probiotics          0
Fortification       0
Gut Health          0
Womens Health       0
Cognitive Health    0
Distribution        0
dtype: int64
```

In [6]:

```
# Analyze the distribution of categories
category_distribution = df['Category'].value_counts()
print("\nCategory Distribution:")
print(category_distribution)
```

```

Category Distribution:
Category
F&B                    6
Bulk (Manufacturer)    4
Name: count, dtype: int64
```

In [7]:

```
# Check for duplicate rows
print(f"Number of duplicate rows: {df.duplicated().sum()}")
```

```
Number of duplicate rows: 0
```

In [8]:

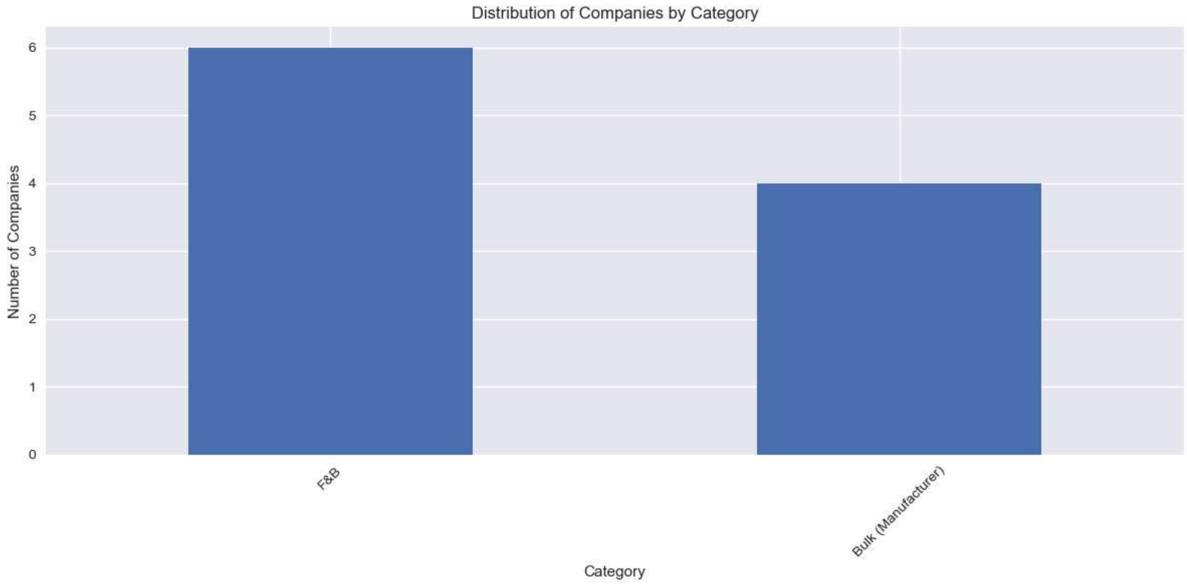
```
# Analyze the distribution of relevant companies
relevant_distribution = df['Relevant'].value_counts()
print("\nRelevant Companies Distribution:")
print(relevant_distribution)
```

```

Relevant Companies Distribution:
Relevant
Yes    9
No     1
Name: count, dtype: int64
```

In [9]:

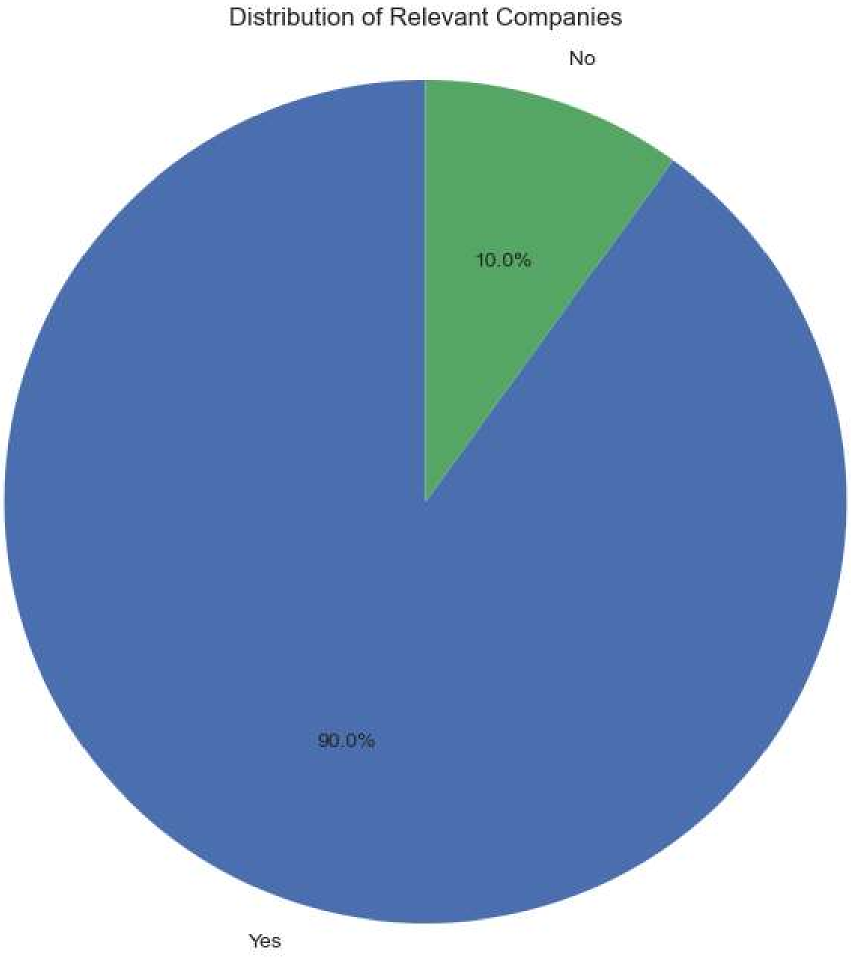
```
# Set the style for better-looking plots
plt.style.use('seaborn')

# 1. Bar plot of Category Distribution
plt.figure(figsize=(12, 6))
category_distribution.plot(kind='bar')
plt.title('Distribution of Companies by Category')
plt.xlabel('Category')
plt.ylabel('Number of Companies')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

```
C:\Users\Lenovo\AppData\Local\Temp\ipykernel_4784\4186668436.py:2: Matplotlib
DeprecationWarning: The seaborn styles shipped by Matplotlib are deprecated s
ince 3.6, as they no longer correspond to the styles shipped by seaborn. Howe
ver, they will remain available as 'seaborn-v0_8-<style>'. Alternatively, dir
ectly use the seaborn API instead.
  plt.style.use('seaborn')
```



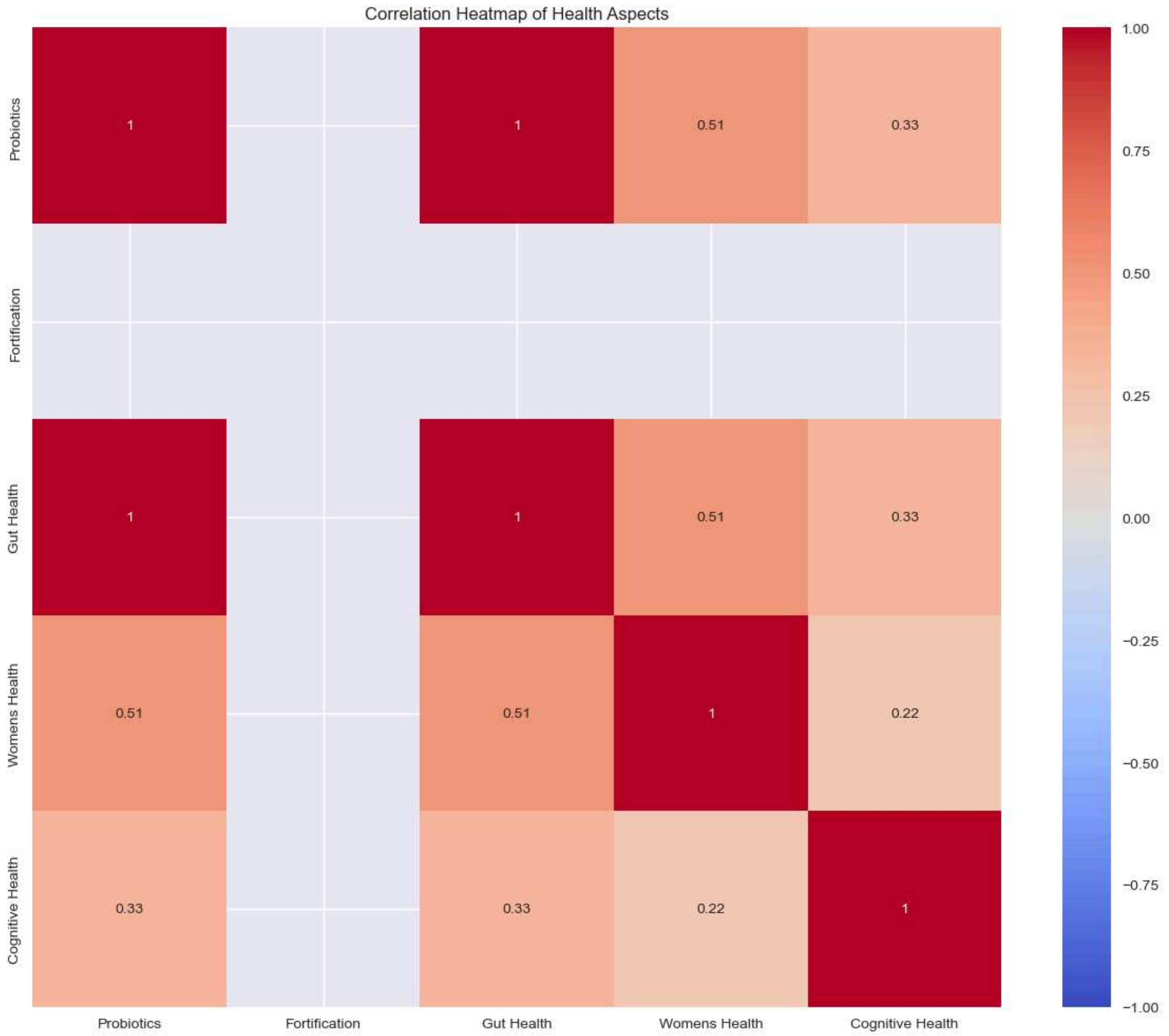
In [10]:

```
# 2. Pie chart of Relevant Companies
plt.figure(figsize=(10, 8))
plt.pie(relevant_distribution, labels=relevant_distribution.index, autopct='%1
plt.title('Distribution of Relevant Companies')
plt.axis('equal')
plt.show()
```



In [11]:

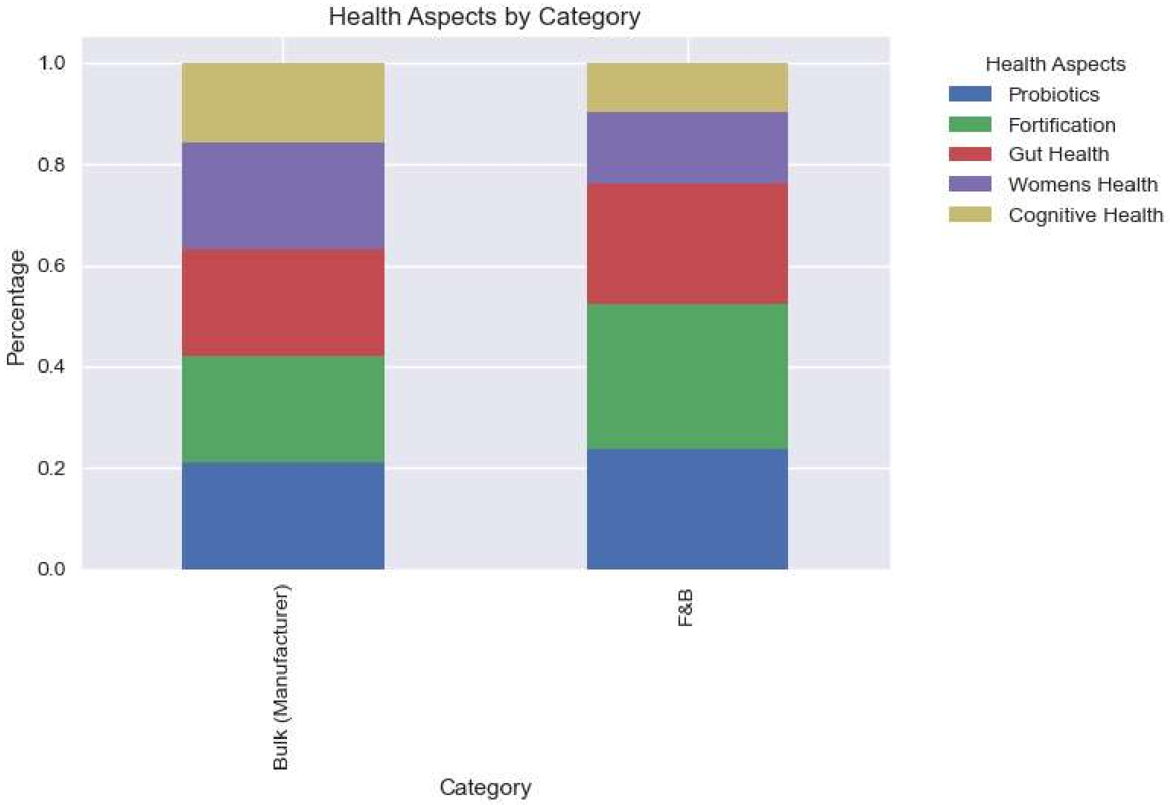
```
# 3. Heatmap of correlations between different health aspects
health_columns = ['Probiotics', 'Fortification', 'Gut Health', 'Womens Health'

# Convert 'Yes' to 1 and 'No' to 0 for the health columns
for col in health_columns:
    df[col] = df[col].map({'Yes': 1, 'No': 0})

correlation_matrix = df[health_columns].corr()

plt.figure(figsize=(12, 10))
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm', vmin=-1, vmax=1,
plt.title('Correlation Heatmap of Health Aspects')
plt.tight_layout()
plt.show()
```



In [12]:

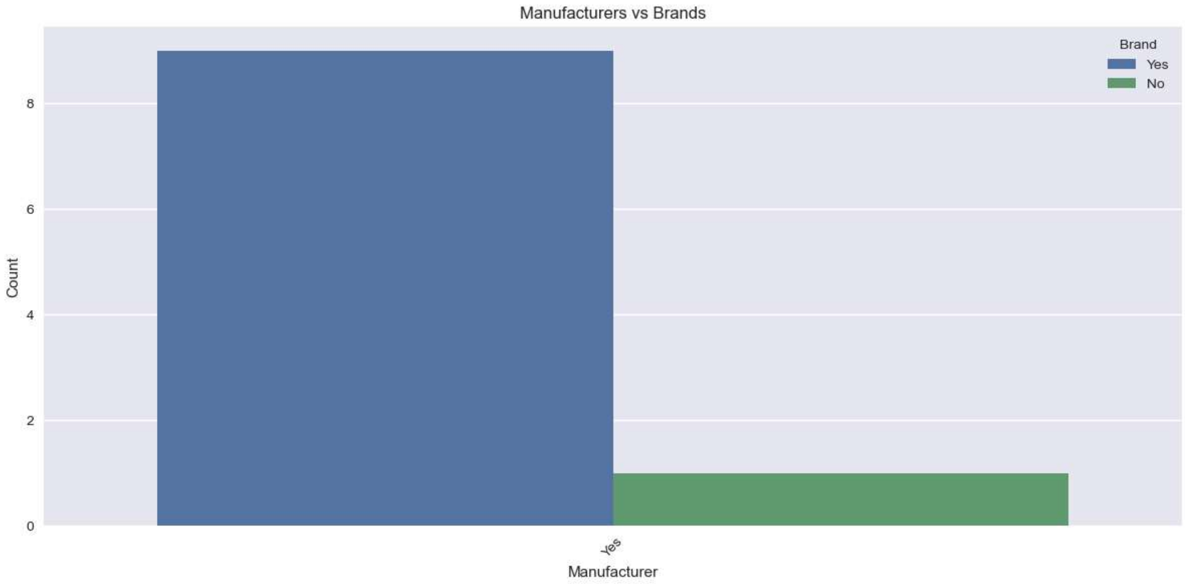
```
# 4. Stacked bar chart of health aspects by category
health_by_category = df.groupby('Category')[health_columns].sum()
health_by_category_percentage = health_by_category.div(health_by_category.sum(

plt.figure(figsize=(12, 8))
health_by_category_percentage.plot(kind='bar', stacked=True)
plt.title('Health Aspects by Category')
plt.xlabel('Category')
plt.ylabel('Percentage')
plt.legend(title='Health Aspects', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.tight_layout()
plt.show()
```

```
<Figure size 1200x800 with 0 Axes>
```



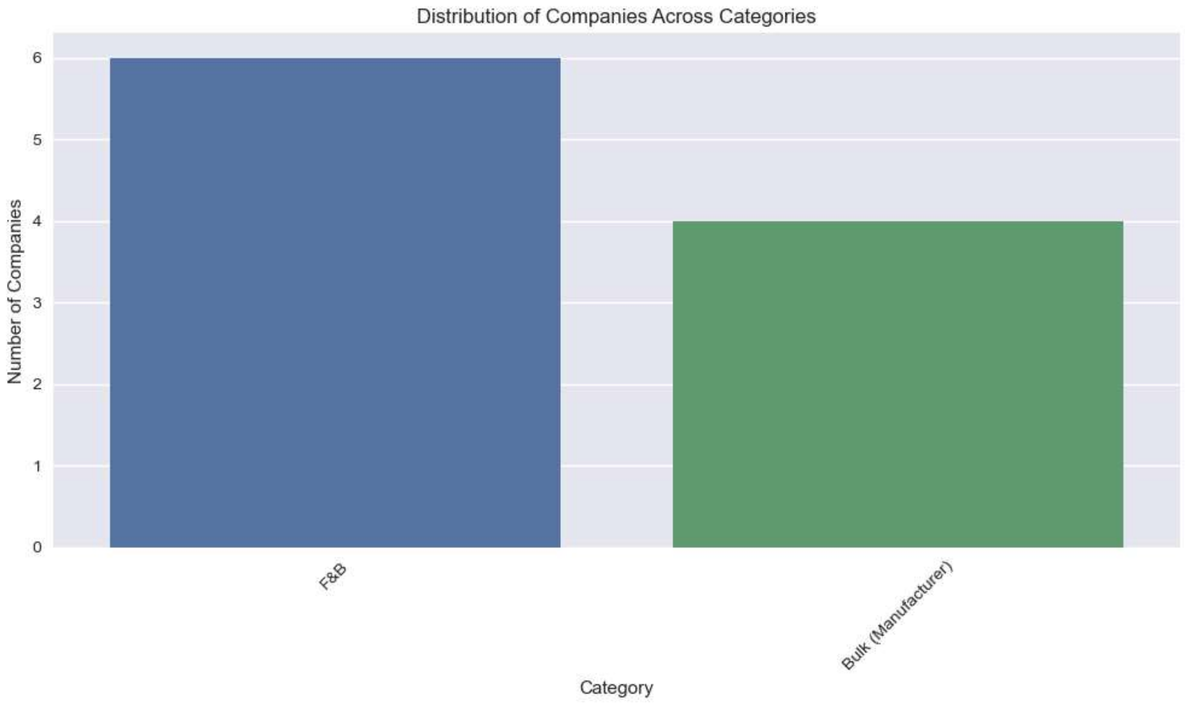
In [13]:

```
# 5. Count plot of manufacturers vs brands
plt.figure(figsize=(12, 6))
sns.countplot(data=df, x='Manufacturer', hue='Brand')
plt.title('Manufacturers vs Brands')
plt.xlabel('Manufacturer')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.legend(title='Brand', loc='upper right')
plt.tight_layout()
plt.show()
```



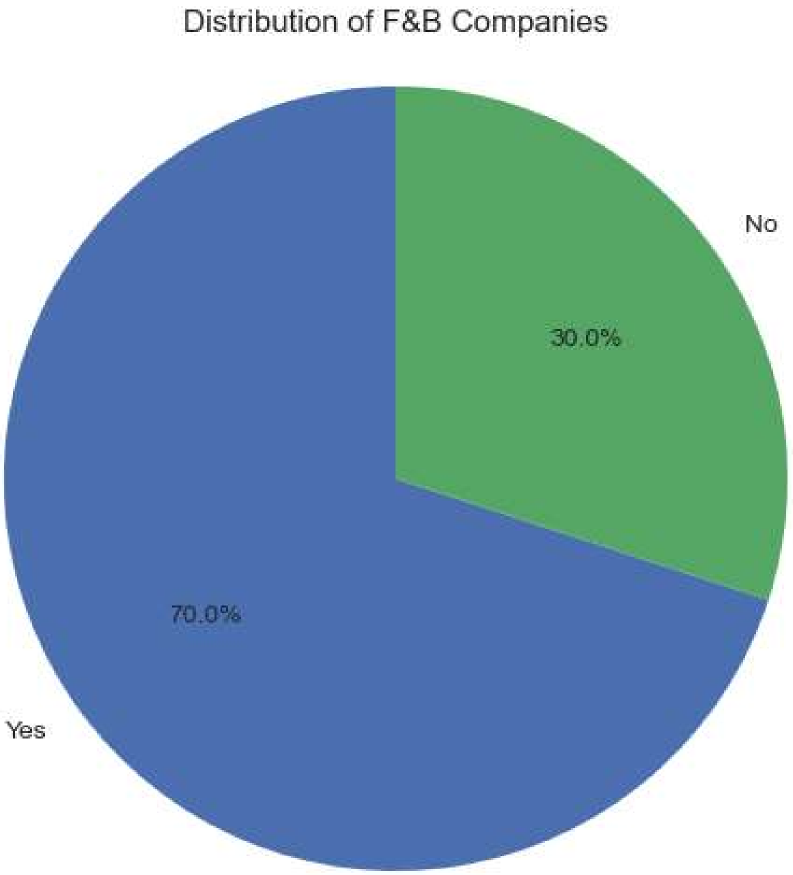
In [14]:

```
# 6. Distribution of companies across categories
plt.figure(figsize=(10, 6))
category_counts = df['Category'].value_counts()
sns.barplot(x=category_counts.index, y=category_counts.values)
plt.title('Distribution of Companies Across Categories')
plt.xlabel('Category')
plt.ylabel('Number of Companies')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



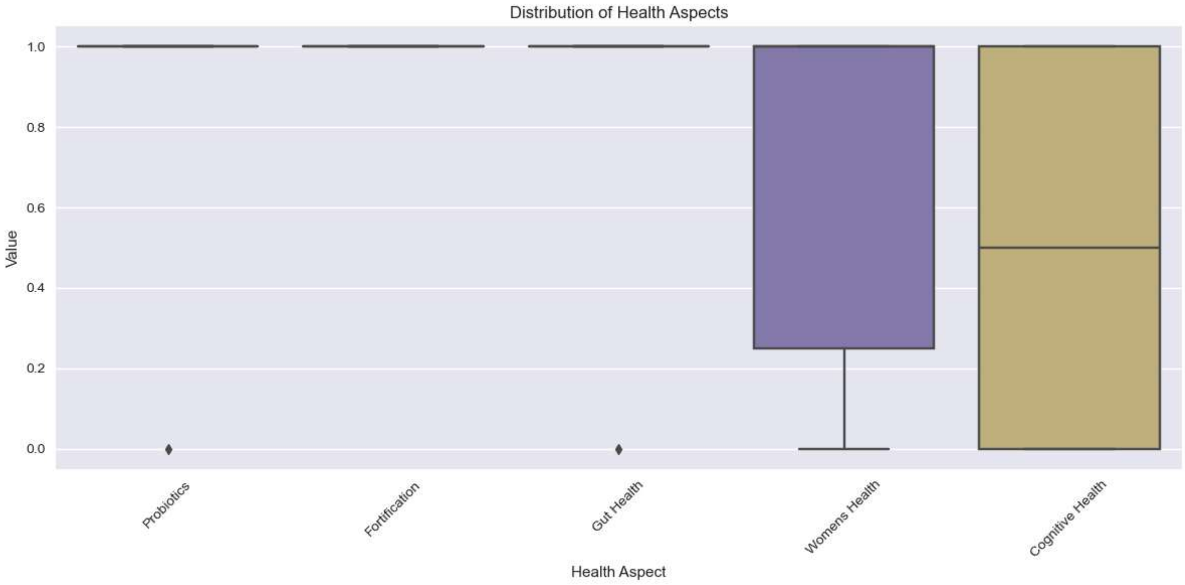
In [15]:

```
# 7. Distribution of F&B companies
plt.figure(figsize=(8, 6))
fb_distribution = df['F&B'].value_counts()
plt.pie(fb_distribution, labels=fb_distribution.index, autopct='%1.1f%%', star
plt.title('Distribution of F&B Companies')
plt.axis('equal')
plt.show()
```



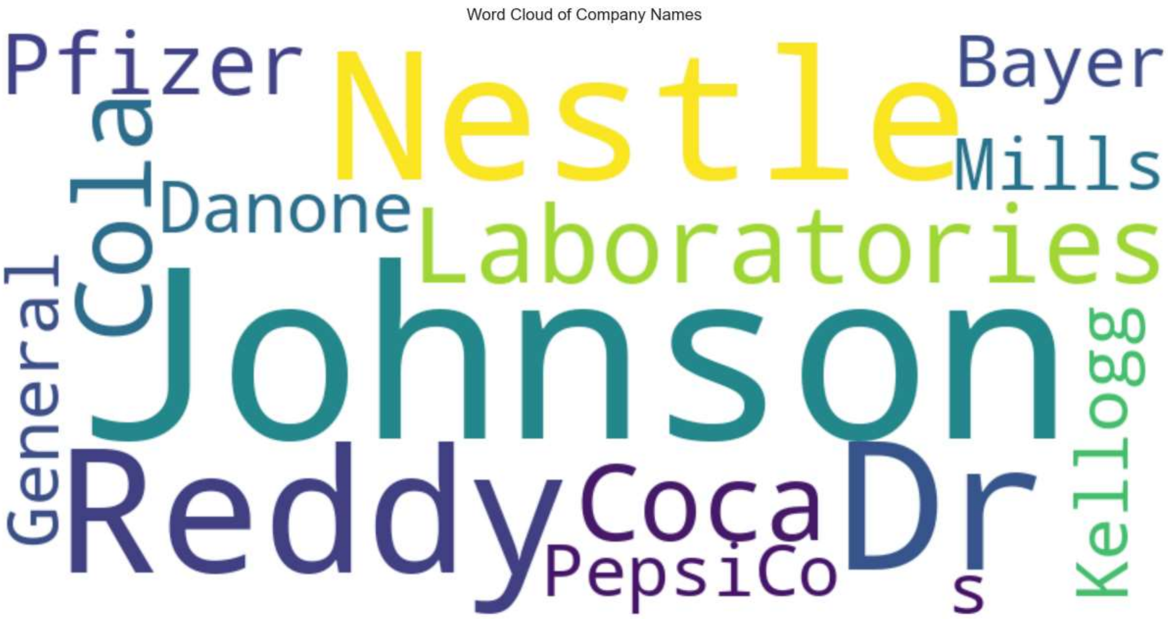
In [16]:

```
# 9. Boxplot of health aspects
plt.figure(figsize=(12, 6))
df_melted = df.melt(id_vars=['Company'], value_vars=health_columns, var_name='
sns.boxplot(data=df_melted, x='Health Aspect', y='Value')
plt.title('Distribution of Health Aspects')
plt.xlabel('Health Aspect')
plt.ylabel('Value')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



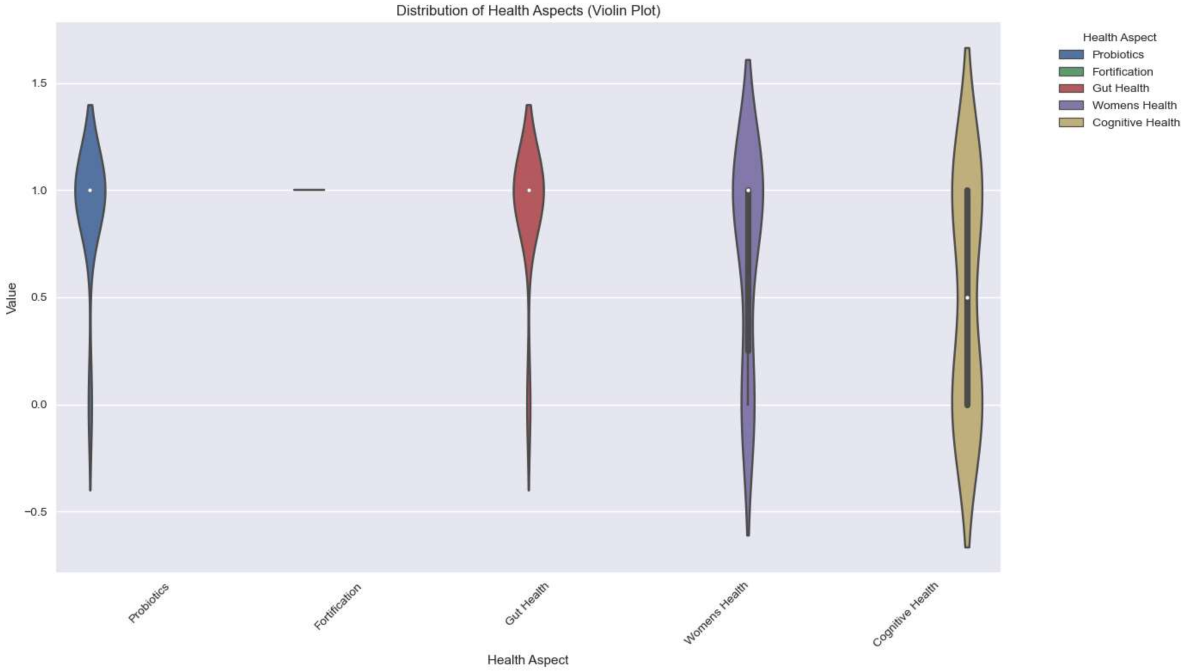
In [17]:

```
# Word Cloud of Company Names
from wordcloud import WordCloud

plt.figure(figsize=(12, 8))
wordcloud = WordCloud(width=800, height=400, background_color='white').generat
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off')
plt.title('Word Cloud of Company Names')
plt.tight_layout(pad=0)
plt.show()
```



In [18]:

```
#Violin plot of health aspects distribution
plt.figure(figsize=(14, 8))
sns.violinplot(data=df_melted, x='Health Aspect', y='Value', hue='Health Aspec
plt.title('Distribution of Health Aspects (Violin Plot)')
plt.xlabel('Health Aspect')
plt.ylabel('Value')
plt.xticks(rotation=45)
plt.legend(title='Health Aspect', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.tight_layout()
plt.show()
```



In [ ]: