In [9]:
```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [10]:
```python
df_cities=pd.read_csv(r"D:\C6 Input Files\Dataset\dim_cities.csv")
df_respondents=pd.read_csv(r"D:\C6 Input Files\Dataset\dim_repondents.csv")
df_fact_survey_responses=pd.read_csv(r"D:\C6 Input Files\Dataset\fact_survey_responses.csv")
```

In [11]:
```python
df_cities.head(5)
```

Out[11]:

	City_ID	City	Tier
0	CT111	Delhi	Tier 1
1	CT112	Mumbai	Tier 1
2	CT113	Bangalore	Tier 1
3	CT114	Chennai	Tier 1
4	CT115	Kolkata	Tier 2

In [12]:
```python
df_cities.isna().sum()
```

Out[12]:
```
City_ID    0
City       0
Tier       0
dtype: int64
```

In [13]:
```python
df_cities.dtypes
```

Out[13]:
```
City_ID    object
City       object
Tier       object
dtype: object
```

In [14]:
```python
df_respondents.head(5)
```

Out[14]:

	Respondent_ID	Name	Age	Gender	City_ID
0	120031	Aniruddh Issac	15-18	Female	CT117
1	120032	Trisha Rout	19-30	Male	CT118
2	120033	Yuvraj Virk	15-18	Male	CT116
3	120034	Pranay Chand	31-45	Female	CT113
4	120035	Mohanlal Joshi	19-30	Female	CT120

In [15]:
```python
df_respondents.isna().sum()
```

Out[15]:
```
Respondent_ID    0
Name             0
Age              0
Gender           0
City_ID          0
dtype: int64
```

In [16]:
```python
df_respondents.dtypes
```

Out[16]:
```
Respondent_ID     int64
Name             object
Age              object
Gender           object
City_ID          object
dtype: object
```

In [22]:
```python
df_respondents["Respondent_ID"]=df_respondents["Respondent_ID"].astype(str)
```

In [23]:
```python
df_respondents.dtypes
```

Out[23]:
```
Respondent_ID    object
Name             object
Age              object
Gender           object
City_ID          object
dtype: object
```

In [24]:
```python
df_fact_survey_responses.head(5)
df_fact_survey_responses.columns
```

Out[24]:
```
Index(['Response_ID', 'Respondent_ID', 'Consume_frequency', 'Consume_time',
       'Consume_reason', 'Heard_before', 'Brand_perception',
       'General_perception', 'Tried_before', 'Taste_experience',
       'Reasons_preventing_trying', 'Current_brands',
       'Reasons_for_choosing_brands', 'Improvements_desired',
       'Ingredients_expected', 'Health_concerns',
       'Interest_in_natural_or_organic', 'Marketing_channels',
       'Packaging_preference', 'Limited_edition_packaging', 'Price_range',
       'Purchase_location', 'Typical_consumption_situations'],
      dtype='object')
```

In [26]:
```python
df_fact_survey_responses.dtypes
```

Out[26]:
```
Response_ID                        int64
Respondent_ID                      int64
Consume_frequency                 object
Consume_time                      object
Consume_reason                    object
Heard_before                      object
Brand_perception                  object
General_perception                object
Tried_before                      object
Taste_experience                   int64
Reasons_preventing_trying         object
Current_brands                    object
Reasons_for_choosing_brands       object
Improvements_desired              object
Ingredients_expected              object
Health_concerns                   object
Interest_in_natural_or_organic    object
Marketing_channels                object
Packaging_preference              object
Limited_edition_packaging         object
Price_range                       object
Purchase_location                 object
Typical_consumption_situations    object
dtype: object
```

In [27]:
```python
df_fact_survey_responses["Respondent_ID"]=df_fact_survey_responses["Respondent_ID"].astype(str)
```

1.Demographic Insights

a. Who prefers energy drink more? (male/female/non-binary?)

In [28]:
```python
df_merge=pd.merge(df_fact_survey_responses,df_respondents, on=["Respondent_ID"])
```

In [29]:
```python
df_merge.head(5)
```

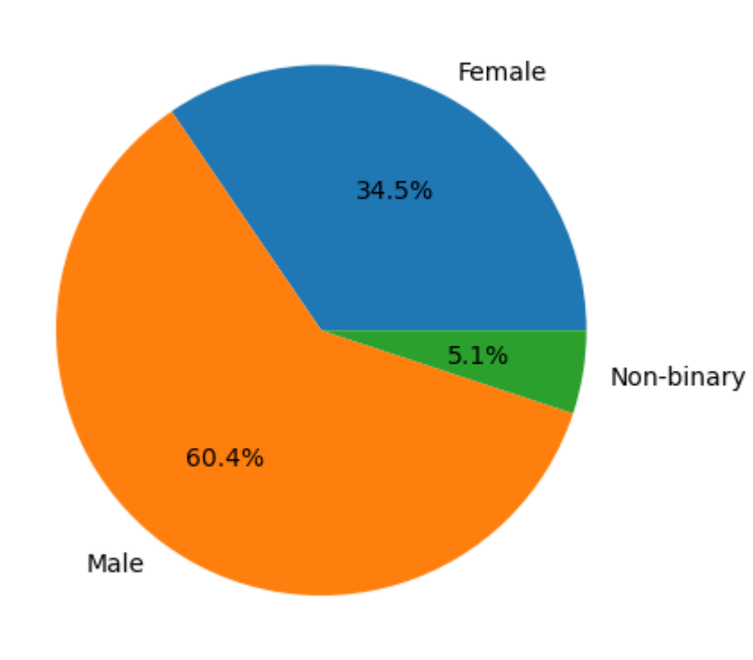
Out[29]:

	Response_ID	Respondent_ID	Consume_frequency	Consume_time	Consume_reason	Heard_before	Brand_perception	General_perception	Tried_before	Taste_experience	...	Marketing_channels	Packaging_preference	Li
0	103001	120031	2-3 times a week	To stay awake during work/study	Increased energy and focus	Yes	Neutral	Not sure	No	5	...	TV commercials	Compact and portable cans	
1	103002	120032	2-3 times a month	Throughout the day	To boost performance	No	Neutral	Not sure	No	5	...	Print media	Compact and portable cans	
2	103003	120033	Rarely	Before exercise	Increased energy and focus	No	Neutral	Not sure	No	2	...	Online ads	Innovative bottle design	
3	103004	120034	2-3 times a week	To stay awake during work/study	To boost performance	No	Positive	Dangerous	Yes	5	...	Online ads	Compact and portable cans	
4	103005	120035	Daily	To stay awake during work/study	Increased energy and focus	Yes	Neutral	Effective	Yes	5	...	Online ads	Compact and portable cans	

5 rows × 27 columns

In [30]:
```python
df_merge.groupby("Gender").size().plot(kind="pie",autopct="%1.1f%%")
plt.title("Gender Distribution")
```

Out[30]: Text(0.5, 1.0, 'Gender Distribution')

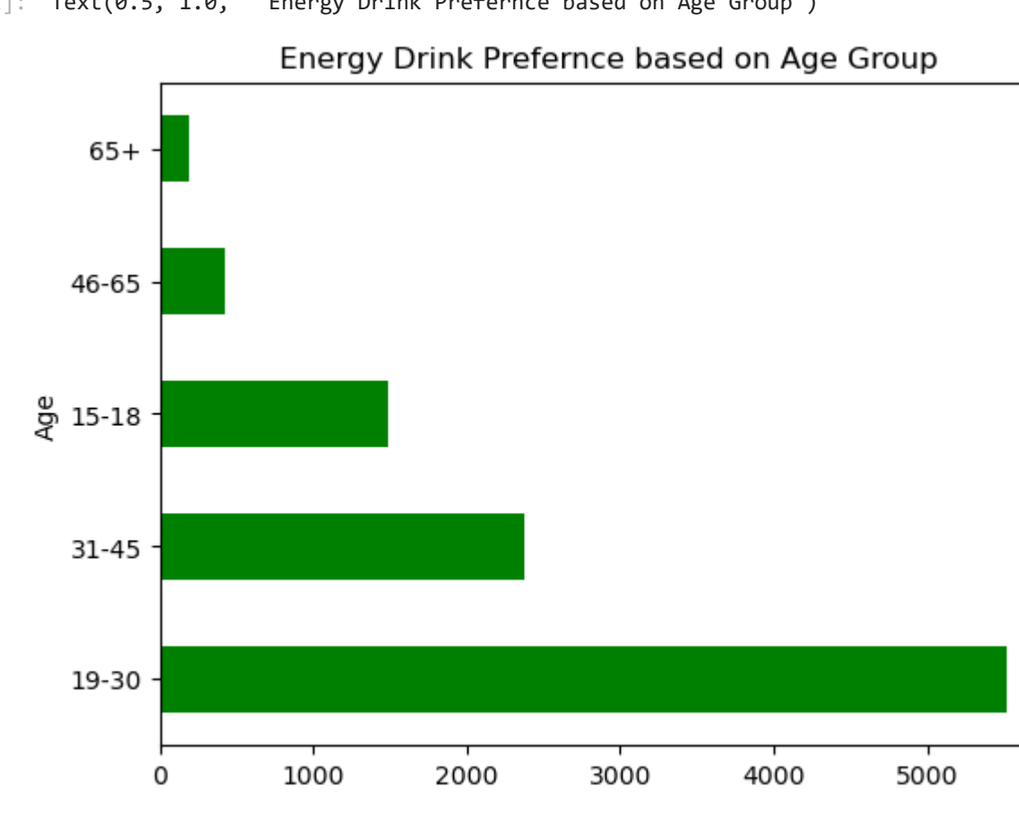


Answer: Male prefers energy drink more followed by Female and Non-binary

b)Which age group prefers energy drinks more?

In [31]:
```python
df_merge.groupby("Age").size().sort_values(ascending=False).plot(kind="barh",color="Green")
plt.title(" Energy Drink Prefernce based on Age Group")
```

Out[31]: Text(0.5, 1.0, ' Energy Drink Prefernce based on Age Group')



Answer: Age Group 19-30 prefer energy drink more followed by 31-45,15-18,46-65,65+

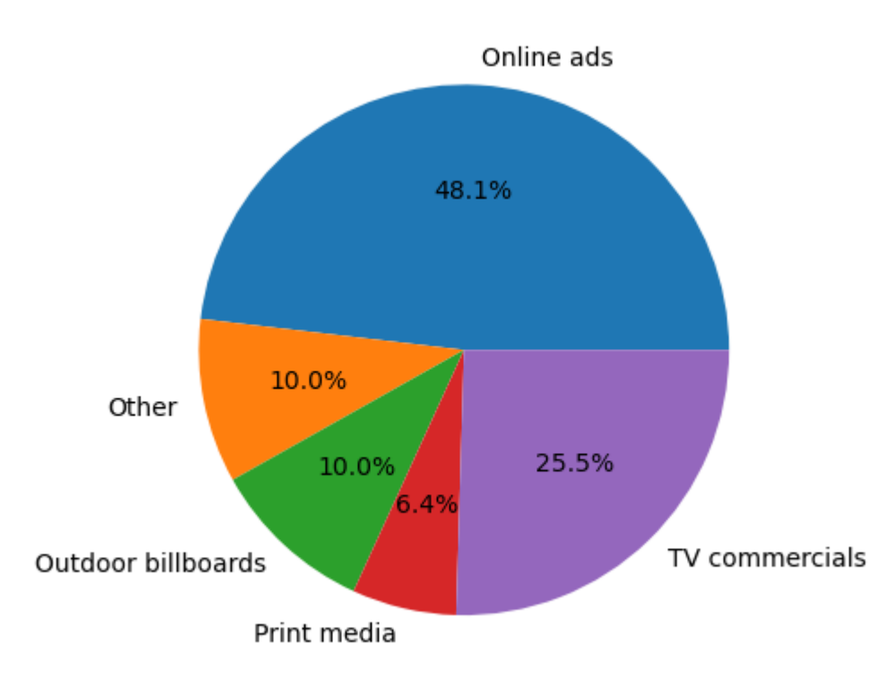
C)Which type of marketing reaches the most Youth (15-30)?

In [32]:
```python
df_filtered = df_merge[df_merge["Age"].isin(["15-18", "19-30"])]
g=df_filtered.groupby("Marketing_channels").size()
g
```

Out[32]:
```
Marketing_channels
Online ads            3373
Other                  702
Outdoor billboards     702
Print media            446
TV commercials        1785
dtype: int64
```

In [26]:
```python
g.plot(kind="pie",autopct="%1.1f%%")
```

Out[26]: <Axes: >



Answer: Online ads reaches most youth

2.Consumer Preferences:

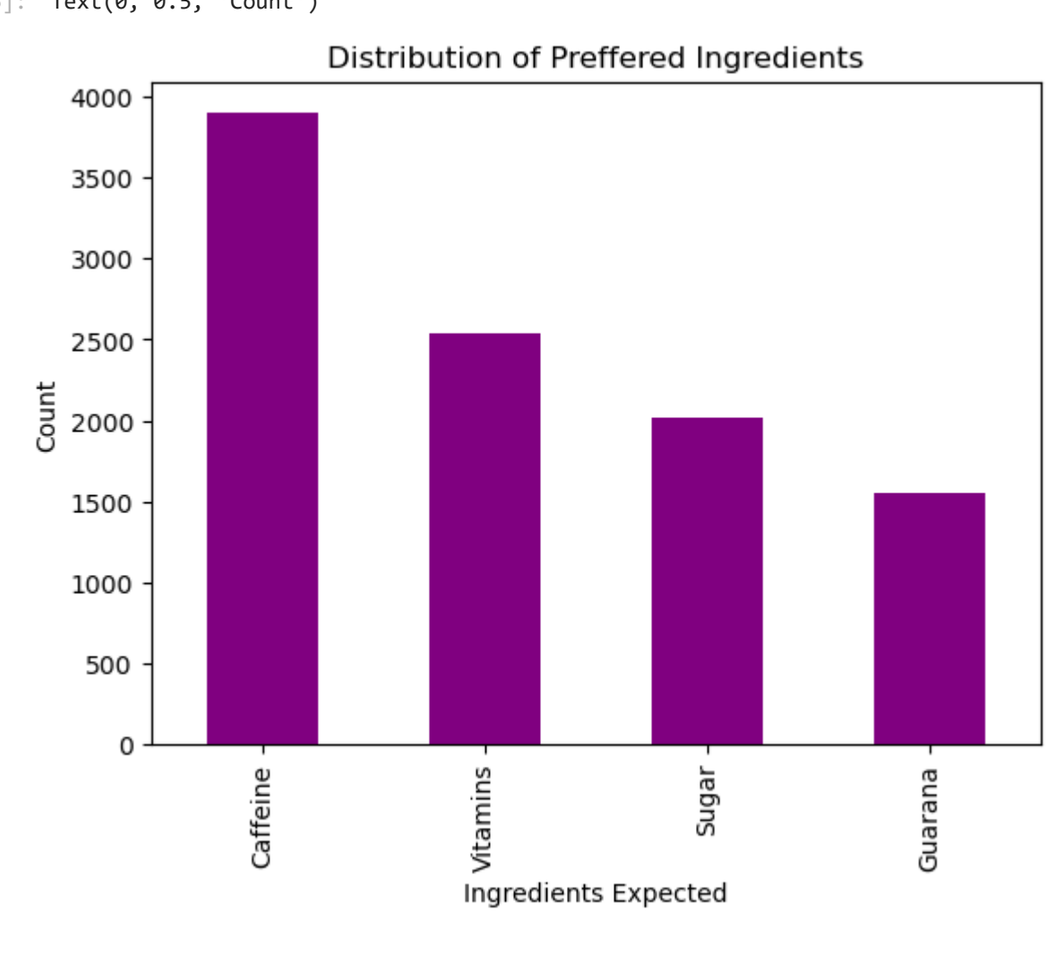
a. What are the preferred ingredients of energy drinks among respondents?

In [33]:
```python
df_ingredients_exp=df_fact_survey_responses.groupby('Ingredients_expected').size().sort_values(ascending=False)
df_ingredients_exp
```

Out[33]:
```
Ingredients_expected
Caffeine    3896
Vitamins    2534
Sugar       2017
Guarana     1553
dtype: int64
```

In [36]:
```python
df_ingredients_exp.plot(kind='bar', x='Ingredients_expected', y='count', color='purple', legend=False)
plt.title("Distribution of Preffered Ingredients")
plt.xlabel("Ingredients Expected")
plt.ylabel("Count")
```

Out[36]: Text(0, 0.5, 'Count')



Answer:Caffeine and Vitamins are the most preferred ingredients

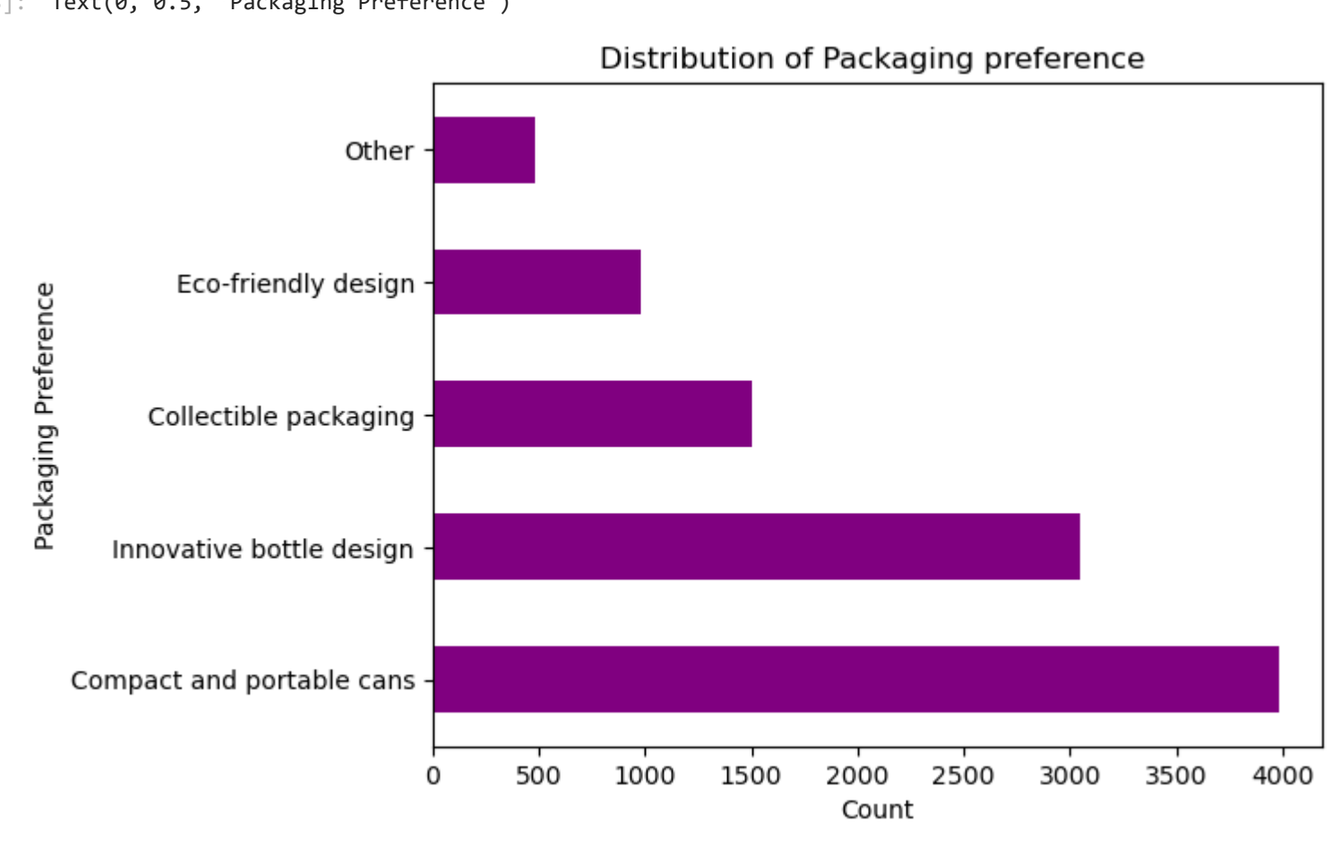
What packaging preferences do respondents have for energy drinks?

In [31]:
```python
df_packaging_pref=df_fact_survey_responses.groupby('Packaging_preference').size().sort_values(ascending=False)
df_packaging_pre
```

Out[31]:
```
Packaging_preference
Compact and portable cans    3984
Innovative bottle design     3047
Collectible packaging        1501
Eco-friendly design           983
Other                         485
dtype: int64
```

In [38]:
```python
df_packaging_pref.plot(kind="barh",color="Purple",y="Packaging Preference")
plt.title("Distribution of Packaging preference ")
plt.xlabel("Count")
plt.ylabel("Packaging Preference")
```

Out[38]: Text(0, 0.5, 'Packaging Preference')



Answer:People prefer Compact and portable cans and Innovative bottle design

3. Competition Analysis:

a. Who are the current market leaders?

In [13]:
```python
df_fact_survey_responses.groupby('Current_brands').size().sort_values(ascending=False).reset_index(name="count")
```

Out[13]:

	Current_brands	count
0	Cola-Coka	2538
1	Bepsi	2112
2	Gangster	1854
3	Blue Bull	1058
4	CodeX	980
5	Sky 9	979
6	Others	479

Answer:Current Market Leaders are Cola-Coka,Bepsi,Gangster

b.What are the primary reasons consumers prefer those brands over ours?

In [29]:
```python
df_filter_brands=df_fact_survey_responses[df_fact_survey_responses['Current_brands'].isin(["Cola-Coka","Bepsi","Gangster","Blue Bull"])]
```

In [30]:
```python
df_filter_brands.groupby(['Reasons_for_choosing_brands']).size().sort_values(ascending=False).reset_index(name="count")
```

Out[30]:

	Reasons_for_choosing_brands	count
0	Brand reputation	1993
1	Taste/flavor preference	1548
2	Availability	1447
3	Effectiveness	1297
4	Other	1277

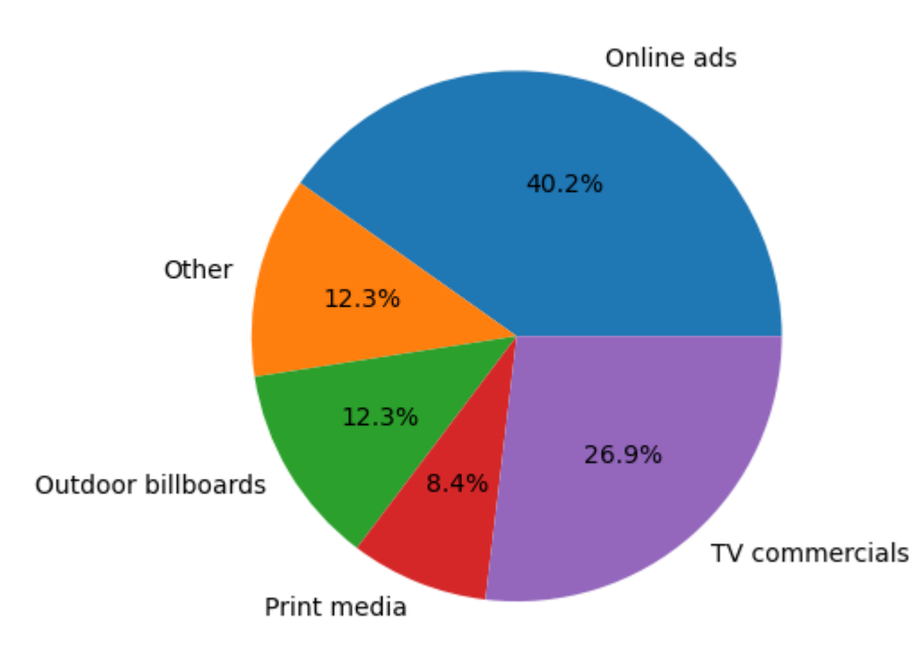
People mostly prefer other brands because of it brand reputation followed by their Taste/flavor preference,Availability,Effectiveness,Other reasons

4. Marketing Channels and Brand Awareness:

a. Which marketing channel can be used to reach more customers?

In [43]:
```python
df_fact_survey_responses.groupby('Marketing_channels').size().plot(kind="pie",autopct="%1.1f%%")
```

Out[43]: <Axes: >



Answer:Online ads and TV commercials can be used to reach customers

b. How effective are different marketing strategies and channels in reaching our customers?

In [53]:
```python
df_marketing_channels=df_fact_survey_responses.groupby('Marketing_channels').size().reset_index(name="Total Count of Marketing Channels")
df_marketing_channels.sort_values(by='Total Count of Marketing Channels',ascending=False)
```

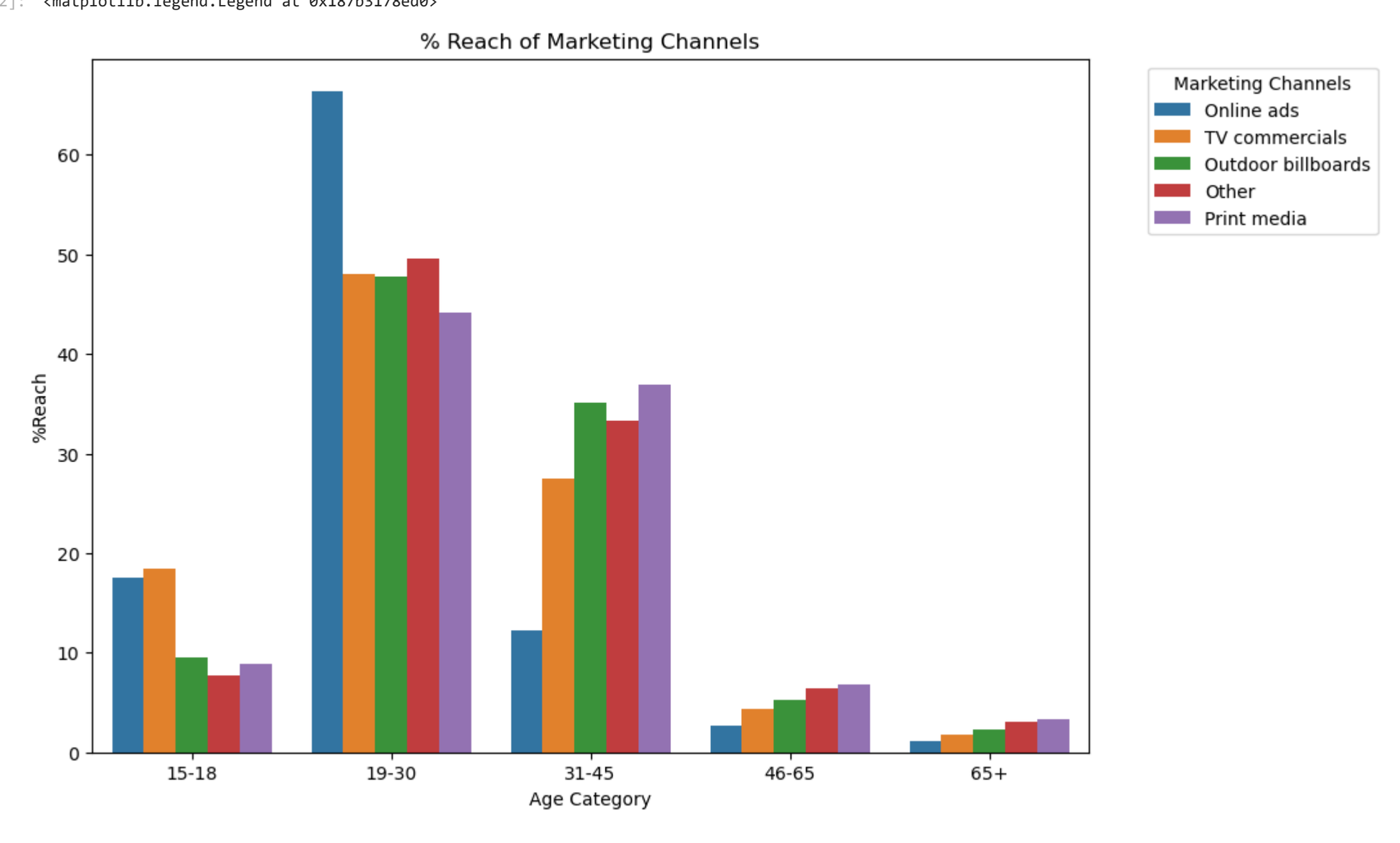
Out[53]:

	Marketing_channels	Total Count of Marketing Channels
0	Online ads	4020
4	TV commercials	2688
2	Outdoor billboards	1226
1	Other	1225
3	Print media	841

In [59]:
```python
df_mar_age=df_merge.groupby(['Age','Marketing_channels']).size().reset_index(name="Count of Marketing Channels")
df_merge2=pd.merge(df_mar_age,df_marketing_channels,on=['Marketing_channels'])
df_merge2['% Reach']=((df_merge2['Count of Marketing Channels']/df_merge2['Total Count of Marketing Channels'])*100).round(2)
df_merge2=df_merge2.sort_values(by='Total Count of Marketing Channels',ascending=False)
```

In [62]:
```python
plt.figure(figsize=(10,7))
sns.barplot(data=df_merge2, x='Age', y='% Reach', hue='Marketing_channels')
plt.title('% Reach of Marketing Channels')
plt.xlabel('Age Category')
plt.ylabel('%Reach')
plt.legend(title='Marketing Channels', bbox_to_anchor=(1.05, 1), loc='upper left')
```

Out[62]: <matplotlib.legend.Legend at 0x187b3178ed0>



Answer:% Reach of online ads is more in age category 19-30

5. Brand Penetration:

a. What do people think about our brand? (overall rating)

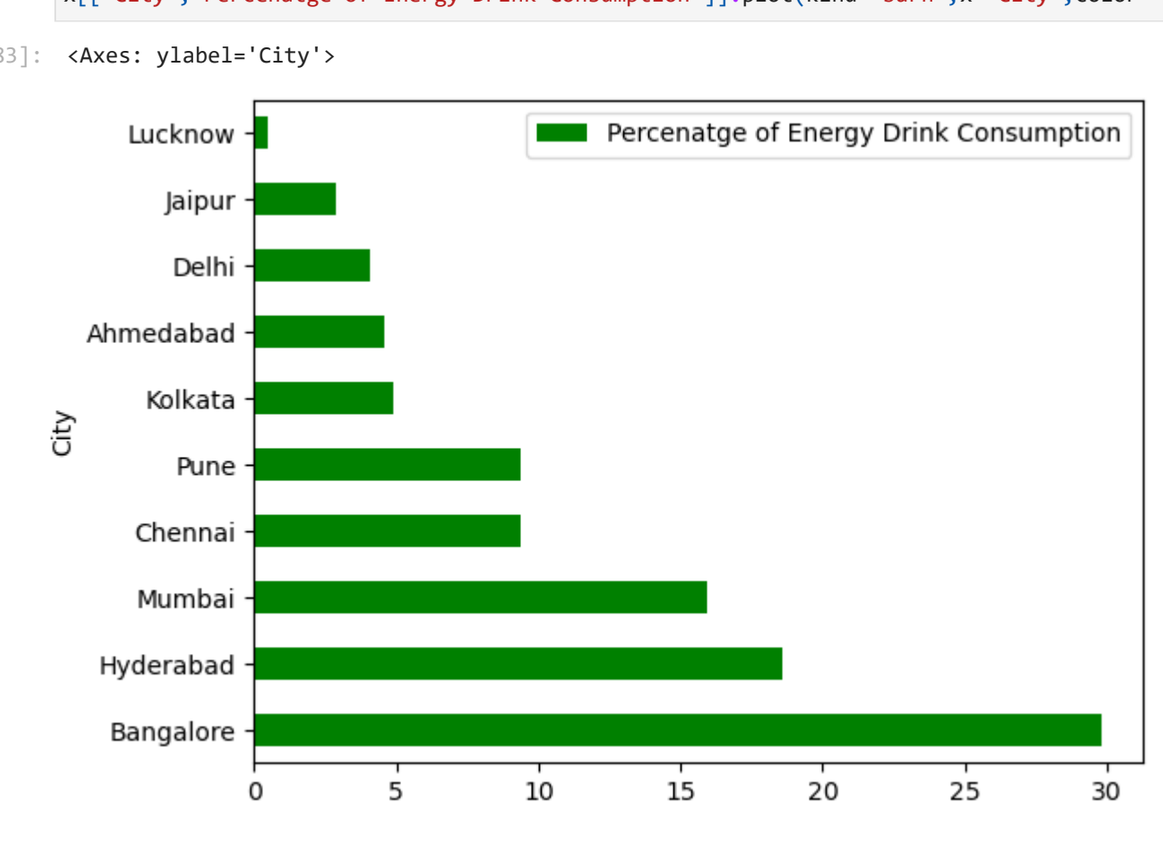
In [34]:
```python
df_codex=df_merge[df_merge['Current_brands'].isin(["CodeX"])]
Overall_Rating=df_codex['Taste_experience'].mean().round(2)
print("Overall Rating:",Overall_Rating)
```

```
Overall Rating: 3.27
```

b. Which cities do we need to focus more on?

In [83]:
```python
df_merge_cities=pd.merge(df_codex,df_cities,on='City_ID')
x=df_merge_cities.groupby('City').size().sort_values(ascending=False).reset_index(name="Count of Energy Drink Consumption")
x["Percenatge of Energy Drink Consumption"]=(x["Count of Energy Drink Consumption"]/x["Count of Energy Drink Consumption"].sum())*100
x[['City','Percenatge of Energy Drink Consumption']].plot(kind="barh",x='City',color="green")
```

Out[83]: <Axes: ylabel='City'>



Answer:We should focus on Bangalore,Hyderabad,Mumbai

6. Purchase Behavior:

a. Where do respondents prefer to purchase energy drinks?

In [46]:
```python
df_fact_survey_responses.groupby("Purchase_location").size().sort_values(ascending=False).reset_index(name="Purchase Count")
```

Out[46]:

	Purchase_location	Purchase Count
0	Supermarkets	4494
1	Online retailers	2550
2	Gyms and fitness centers	1464
3	Local stores	813
4	Other	679

Answer:They prefer Supermarkets,Online retailers,Gyms and fitness centers

b. What are the typical consumption situations for energy drinks among respondents?

In [5]:
```python
df_fact_survey_responses.groupby("Typical_consumption_situations").size().sort_values(ascending=False).reset_index(name="Frequency of Consumption")
```

Out[5]:

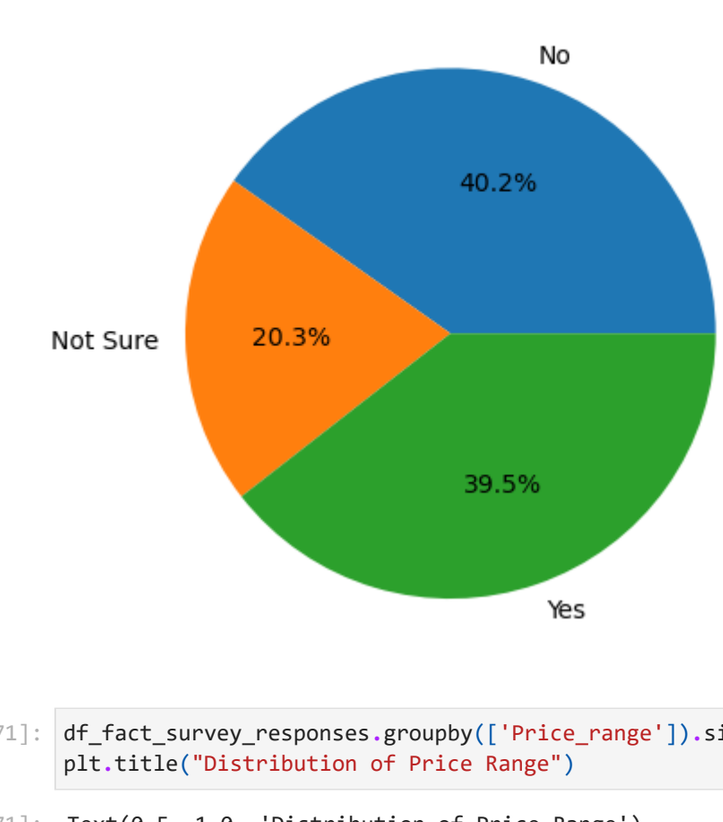
	Typical_consumption_situations	Frequency of Consumption
0	Sports/exercise	4494
1	Studying/working late	3231
2	Social outings/parties	1487
3	Other	491
4	Driving/commuting	297

Answer:People consume Energy drinks more during sports/excercise and when they study and work

c. What factors influence respondents' purchase decisions, such as price range and limited edition packaging?

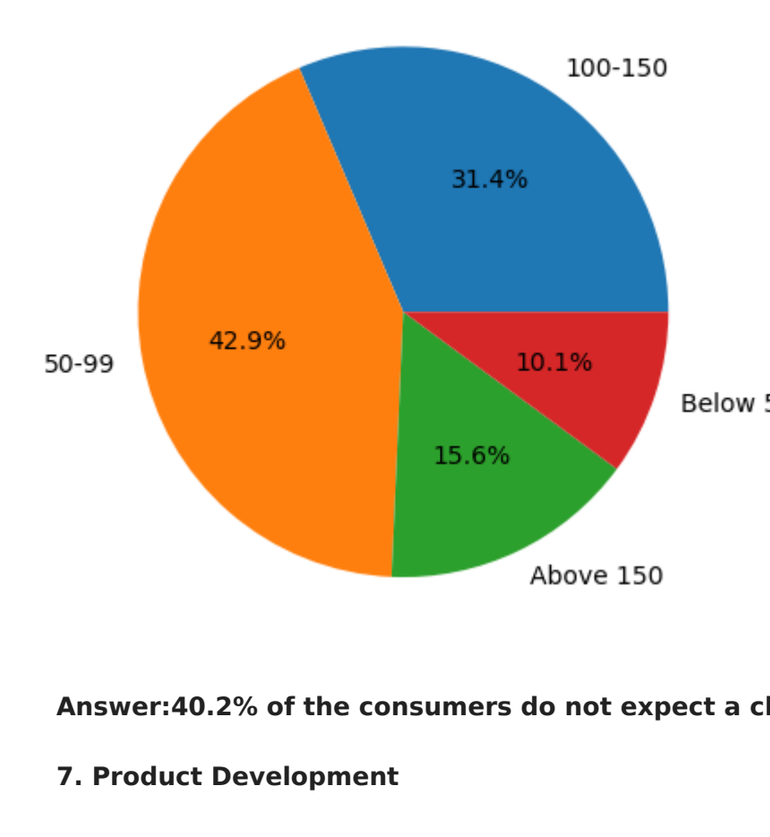
In [65]:
```python
df_fact_survey_responses.groupby(['Limited_edition_packaging']).size().plot(kind="pie",autopct="%1.1f%%")
plt.title("Distribution of Limited Edition Packaging")
```

Out[65]: Text(0.5, 1.0, 'Distribution of Limited Edition Packaging')



In [71]:
```python
df_fact_survey_responses.groupby(['Price_range']).size().plot(kind="pie",autopct="%1.1f%%")
plt.title("Distribution of Price Range")
```

Out[71]: Text(0.5, 1.0, 'Distribution of Price Range')



Answer:40.2% of the consumers do not expect a change in the packaging while 39.5% of consumers are open to trying the Limited Edition Packaging. 42.9% people prefer price range of 50-99 Rs

7. Product Development

a. Which area of business should we focus more on our product development? (Branding/taste/availability)

In [37]:
```python
df_codex.groupby('Taste_experience').size().reset_index(name="Response Frequency")
```

Out[37]:

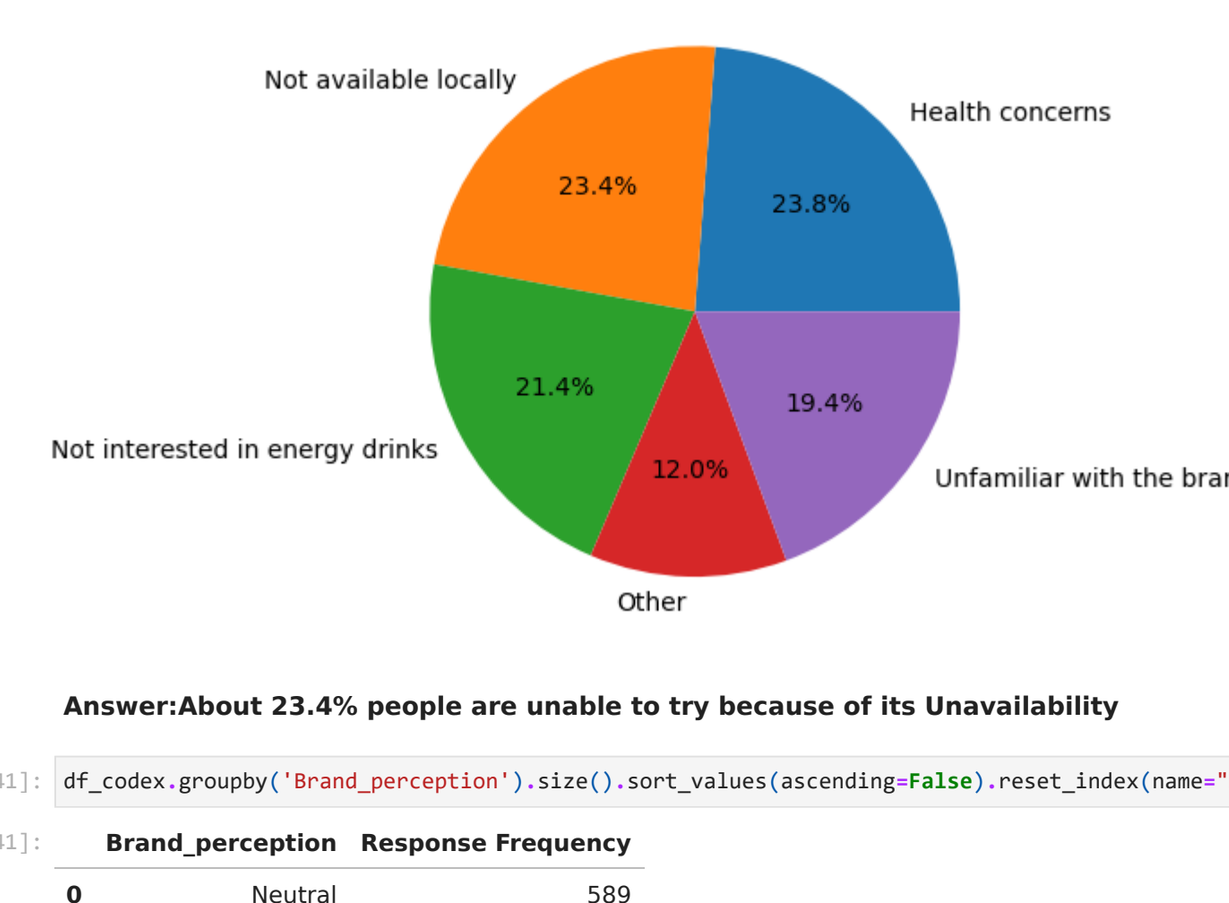
	Taste_experience	Response Frequency
0	1	107
1	2	148
2	3	286
3	4	248
4	5	191

In [95]:
```python
df_codex.query('Reasons_preventing_trying=="Not available locally"').groupby('Reasons_preventing_trying').size()
x=df_codex.groupby('Reasons_preventing_trying').size()
x
```

Out[95]:
```
Reasons_preventing_trying
Not available locally    229
dtype: int64
```

In [39]:
```python
df_codex.groupby('Reasons_preventing_trying').size().plot(kind="pie",autopct="%1.1f%%")
```

Out[39]: <Axes: >



Answer:About 23.4% people are unable to try because of its Unavailability

In [41]:
```python
df_codex.groupby('Brand_perception').size().sort_values(ascending=False).reset_index(name="Response Frequency")
```

Out[41]:

	Brand_perception	Response Frequency
0	Neutral	589
1	Positive	219
2	Negative	172

Answer:Only 219 people have positive response

Recommendations to Marketing Team:

1.What immediate improvements can we bring to the product?

Answer:Based on the response we should focus on 1.Product Availability 2.Packaging- Compact Portable cans 3.Ingredients- Caffeine and vitamins more

2.What should be the ideal price of our product?

Answer:Based on the response people majority of people prefer Price Range-50-150

3.What kind of marketing campaigns, offers, and discounts we can run?

Answer:Since reach of online ads are more the age group 19-30, marketing campaigns through social media influencers(mainly instagram) can have potential impact and also by providing exclusive offers in limited edition packaging can create hype among audience

4.Who can be a brand ambassador, and why?

Answer: A suitable brand ambassador should possess nationwide recognition and appeal to our target audience, primarily located in Bangalore, Hyderabad, and Mumbai. Considering these requirements, I recommend Yash, the star of KGF, and Rashmika Mandanna. Both celebrities have achieved widespread fame across India and maintain strong connections with the audience.