K-Means , Agglomerative and DBSCAN on Amazon Fine Food Reviews DataSet:

Data Source: https://www.kaggle.com/snap/amazon-fine-food-reviews (https://www.kaggle.com/snap/amazon-fine-food-reviews)

The Amazon Fine Food Reviews dataset consists of reviews of fine foods from Amazon.

Number of reviews: 568,454

Number of users: 256,059

Number of products: 74,258

Timespan: Oct 1999 - Oct 2012

Number of Attributes/Columns in data: 10

Attribute Information:

Id - Id of the row in the dataset

ProductId - unique identifier for the product

UserId - unqiue identifier for the user

ProfileName - name on the profile

HelpfulnessNumerator - number of users who found the review helpful

HelpfulnessDenominator - number of users who indicated whether they found the review helpful or not

Score - rating between 1 and 5

Time - timestamp for the review

Summary - brief summary of the review

Text - text of the review

Objective:

To apply the K-Means Clustering Algorithm on the Bow , TF-IDF Vectors and computing the best K value for each Vectors and finding the word cloud for each clusters formed .

Agglomerative Clustering:

1. Apply agglomerative algorithm and try a different number of clusters like 2,5 etc.
2. Same as that of K-means, plot word clouds for each cluster.
3. You can take around 5000 reviews or so(as this is very computationally expensive one) to perform hierarchical clustering because they do take a considerable amount of time to run.

Step-By-Step procedure

1. In this, we need to work with all 4-vectorizers (BOW, TFIDF,Avg w2v and TF-IDF weighted w2v) where we will convert our texted review into numerical(vector) form in order to apply any Model on it.
2. After that we will take our cleandedtext(i.e cleand text means we have already cleaned our data by removing stops words, other this which are going to affect our model) and then we will take only test data not their respective class lable because as we know we are goint to apply K-means clustering algo which do not required class lables. what is does is it mainly group/clusters the similar data points
3. As we know Agglomerative is a Clustering algo but it works in different way that the k-means works. As we know Agglomerative clustering starts with each points beings a individual clusters and then it starts to group the clusters based on some sense of similirities/distance and so we dont need to give the or tune to getting best k as a hyperparameters and if we want n_clusters we can get it at that range. So we try to implement Agglomerative clustering with different number of clusters and try to see the reviews in the clusters

In [2]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns


%matplotlib inline

import sqlite3
import string
import nltk

from sklearn.decomposition import TruncatedSVD
from sklearn.feature_extraction.text import TfidfTransformer
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.feature_extraction.text import CountVectorizer

import re
import string
from gensim.models import Word2Vec
from gensim.models import KeyedVectors
import pickle
import os
from tqdm import tqdm

from sklearn.cross_validation import cross_val_score
from sklearn.metrics import accuracy_score
from sklearn.cross_validation import train_test_split
from sklearn.metrics import confusion_matrix
from sklearn.metrics import make_scorer
from sklearn.metrics import f1_score
from sklearn.decomposition import TruncatedSVD
from sklearn.preprocessing import StandardScaler
from sklearn.model_selection import GridSearchCV
from sklearn.model_selection import RandomizedSearchCV
from sklearn.metrics import precision_score
from sklearn.metrics import f1_score
from sklearn.model_selection import TimeSeriesSplit
from sklearn.metrics import recall_score
from sklearn.metrics import classification_report
from sklearn.metrics import roc_auc_score
from sklearn.metrics import roc_curve, auc
from sklearn.linear_model import SGDClassifier
from sklearn.ensemble import BaggingClassifier
from sklearn.multiclass import OneVsRestClassifier
from sklearn.svm import SVC
from sklearn.svm import LinearSVC

import warnings
warnings.filterwarnings('ignore')

# ============================== data preprocessing ==============================
# Making the connection to the database.sqlite
con = sqlite3.connect("C:\\Users\\Ashu\\Desktop\\AAIC\\IPython Notebooks\\AMAZON F
```

```
C:\Users\Ashu\Miniconda3\lib\site-packages\gensim\utils.py:1197: UserWarning:
detected Windows; aliasing chunkize to chunkize_serial
  warnings.warn("detected Windows; aliasing chunkize to chunkize_serial")
C:\Users\Ashu\Miniconda3\lib\site-packages\sklearn\cross_validation.py:41: Dep
recationWarning: This module was deprecated in version 0.18 in favor of the mo
del_selection module into which all the refactored classes and functions are m
oved. Also note that the interface of the new CV iterators are different from
that of this module. This module will be removed in 0.20.
  "This module will be removed in 0.20.", DeprecationWarning)
C:\Users\Ashu\Miniconda3\lib\site-packages\sklearn\ensemble\weight_boosting.p
y:29: DeprecationWarning: numpy.core.umath_tests is an internal NumPy module a
nd should not be imported. It will be removed in a future NumPy release.
  from numpy.core.umath_tests import inner1d
```

In [3]:
```
# Extracting out the positive and negative features
amazon_featured_reviews = pd.read_sql_query("""SELECT * FROM REVIEWS WHERE SCORE !

print(amazon_featured_reviews.shape)




# Creating the partition function returning the positive or negative reviews and a
# of ratings given:

def partition(x):
        if x < 3:
            return 0
        else :
            return 1


pos_neg_reviews_df = amazon_featured_reviews['Score'].map(partition)
print(type(pos_neg_reviews_df) , 'pos_neg_reviews_df' , pos_neg_reviews_df.shape)
print('type(amazon_featured_reviews):' , type(amazon_featured_reviews))
amazon_featured_reviews['Score'] = pos_neg_reviews_df
amazon_featured_reviews.shape
amazon_featured_reviews.head(2)
```

```
(525814, 10)
<class 'pandas.core.series.Series'> pos_neg_reviews_df (525814,)
type(amazon_featured_reviews): <class 'pandas.core.frame.DataFrame'>
```

Out[3]:

	Id	ProductId	UserId	ProfileName	HelpfulnessNumerator	HelpfulnessDenominat
0	1	B001E4KFG0	A3SGXH7AUHU8GW	delmartian	1	
1	2	B00813GRG4	A1D87F6ZCVE5NK	dll pa	0	

In [4]:
```
# Data deduplication is used to clean the data having redundancy and many unwanted
# use the data:

duplicate_df = pd.read_sql_query("""SELECT * FROM REVIEWS WHERE SCORE !=3 AND Text
                                    (SELECT Text FROM REVIEWS
                                    GROUP BY Text having count(*) > 1)
                                    """ , con)
duplicate_df.head(4)

#So we can see there are many such duplicated rows having some column values simil
```

Out[4]:

	Id	ProductId	UserId	ProfileName	HelpfulnessNumerator	HelpfulnessDenominat
0	4	B000UA0QIQ	A395BORC6FGVXV	Karl	3	
1	11	B0001PB9FE	A3HDKO7OW0QNK4	Canadian Fan	1	
2	30	B0001PB9FY	A3HDKO7OW0QNK4	Canadian Fan	1	
3	70	B000E7VI7S	AWCBF2ZWIN57F	C. Salcido	0	

In [5]:
```
#Doing some other check using the below query to see whether such reduncdancy is o
# From count(*) values we can see that we have so much of redundant data, so it ha
dup_data = pd.read_sql_query("""
select ID,ProductID,USERID , PROFILENAME , Summary ,text ,count(*) AS COUNT
FROM REVIEWS
GROUP BY PRODUCTID,SUMMARY,TEXT
having count(*) > 1""",con)
dup_data.head(6)
```

Out[5]:

	Id	ProductId	UserId	ProfileName	Summary	Text	COUNT
0	171154	7310172001	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	best dog treat-- great for training--- all do...	Freeze dried liver has a hypnotic effect on do...	2
1	217385	7310172101	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	best dog treat-- great for training--- all do...	Freeze dried liver has a hypnotic effect on do...	2
2	369857	B000084DWM	A3TVZM3ZIXG8YW	christopher hayes	Filler food is empty, leaves your cat always n...	This review will make me sound really stupid, ...	10
3	369801	B000084DWM	A36JDIN9RAAIEC	Jon	Great product, but trust your vet not the hype	I have two cats, one 6 and one 2 years old. Bo...	2
4	410265	B000084EZ4	A2FGXWWR8ZU59C	Thomas Lawrence	Cats love the food, but no pull-tab top, and d...	I appreciate being able to buy this larger, mo...	2
5	410304	B000084EZ4	A29JUMRL1US6YP	HTBK	Fantastic Food for Good Cat Health	The pet food industry can be one of the most i...	4

In [6]:
```
# Let's see another case:

dup_data = pd.read_sql_query("""SELECT * FROM REVIEWS
                                WHERE SCORE != 3 AND UserId = "AJD41FBJD9010"
                                Order by ProductID""" , con)

dup_data
```

Out[6]:

	Id	ProductId	UserId	ProfileName	HelpfulnessNumerator	HelpfulnessDenominato
0	171152	7310172001	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	0	
1	171153	7310172001	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	0	
2	171154	7310172001	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	0	
3	171189	7310172001	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	39	5
4	171223	7310172001	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	1	
5	171228	7310172001	AJD41FBJD9010	N. Ferguson "Two, Daisy, Hannah, and Kitten"	5	

Observation:

In above Analysis what we found is :

There are product's having the same productID's with same {'TEXT'} , {'Timestamp'} , {'UserID'}

There are products having the different productID's with same {'TEXT'} , {'Timestamp'} , {"helpfullnessNumerator"} , {"HelpfullnessNumerator"}

We termed such type of the data in our data set as Redundant Data , so we perform various cleaning methods to remove them from

the Data Set.

In [7]:
```
#Removing the Duplicate data points:

duplicated_data = amazon_featured_reviews.duplicated(subset={'UserId','ProfileName
duplicated_data = pd.DataFrame(duplicated_data , columns=['Boolean'])
print(duplicated_data.head(5))

#True values in the Boolean Series represents the duplicate data:
print(duplicated_data['Boolean'].value_counts(dropna=False)) #gives me the total n

#The total no of duplicates here in the amazon_featured_reviews are:
print("total no of duplicates here in the amazon_featured_reviews are:",duplicated

#dropping the duplicates:
final = amazon_featured_reviews.sort_values(by='ProductId',kind='quicksort',ascend
final = final.drop_duplicates(subset={'UserId','ProfileName','Time','Text'} , keep
print('\n','DataFrame final shape before removing helpfullness data :', final.shap

#Also removing the instances where HelpfulnessNumerator >= HelpfulnessDenominator:
final = final[final['HelpfulnessNumerator'] <= final['HelpfulnessDenominator']]
print('final', final.shape)
```

```
   Boolean
0    False
1    False
2    False
3    False
4    False
False    365333
True     160481
Name: Boolean, dtype: int64
total no of duplicates here in the amazon_featured_reviews are: Boolean    160
481
dtype: int64

 DataFrame final shape before removing helpfullness data : (364173, 10)
final (364171, 10)
```

In [8]:
```
#Finding the books data in the amazon_featured_reviews using the regex:
import re
print(final.columns)
def analyzing_summary_book(filtered_data , regex):

    mask_summary = filtered_data.Summary.str.lower().str.contains(regex)
    mask_text =    filtered_data.Text.str.lower().str.contains(regex)
    print(len(filtered_data[mask_summary].index) , len(filtered_data[mask_text].in
    print('initial shape of the filtered_data' , filtered_data.shape)
    filtered_data.drop(filtered_data[mask_summary].index , inplace=True , axis=0)
    filtered_data.drop(filtered_data[mask_text].index , axis=0 , inplace=True)
```

```
Index(['Id', 'ProductId', 'UserId', 'ProfileName', 'HelpfulnessNumerator',
       'HelpfulnessDenominator', 'Score', 'Time', 'Summary', 'Text'],
      dtype='object')
```

In [9]:
```
#Removing the Books reviews we get below final dataframe:
#On observation of some of the reviews we got certain keywords related to books,re
#So we removed these words as much as possible:


print('final shape before removing books reviews:' , final.shape)
analyzing_summary_book(final , re.compile(r'reading|books|book|read|study|learn|po

print('final shape after removing the book reviews:' , final.shape)
```

```
final shape before removing books reviews: (364171, 10)
2842 36649
initial shape of the filtered_data (364171, 10)
final shape after removing the book reviews: (326808, 10)
```

In [10]:
```
#Computing the proportion of positive and negative class labels in the DataFrame:
final['Score'].value_counts()
```

Out[10]:
```
1    276668
0     50140
Name: Score, dtype: int64
```

In [11]:
```
import nltk
from nltk.stem import SnowballStemmer
from nltk.corpus import stopwords
from nltk.stem.wordnet import WordNetLemmatizer
from nltk.stem import PorterStemmer

stop = set(stopwords.words('english'))
print(stop)
print('\n' , 'length of stopwords set' , len(stop))

print("*" * 30)

sno = SnowballStemmer('english')
```

```
{'so', 'himself', 'be', 'had', 'shouldn', 'its', 'mustn', 'if', 'wouldn', 'do
n', 'm', 'this', 's', 'ours', 'a', 'about', 'own', 'doing', "needn't", 'now',
'i', 'yourself', 'were', 'during', 'in', 'y', 'been', 'any', 'having', "you'v
e", 'of', 'shan', 'whom', "won't", "hadn't", "weren't", 'what', 'for', 'belo
w', 'themselves', 'does', 'will', 'them', 'at', 'than', 'was', 'wasn', 'you',
'each', 'theirs', 'between', 'those', 'very', "haven't", 'she', 'as', 'that',
'myself', 'before', 'there', 'no', 'only', 'yourselves', 'itself', 'same', 'ar
en', 'are', 'too', 'haven', 'because', 'hers', 'my', 'further', 'these', 'of
f', 'again', 'should', 'our', 'and', 'o', "hasn't", "didn't", 'they', 'do', 'b
oth', "you'll", 'ourselves', 'until', "she's", 'didn', 'to', 'more', 'yours',
"doesn't", 'most', 'but', 'once', "wouldn't", 'all', 'being', 'against', 'th
e', 'an', 'or', 'weren', "mustn't", 'after', 'on', 'doesn', 'up', "shouldn't",
"you'd", 'with', 'their', 'won', "isn't", 'needn', 'some', 'which', 'how', 'v
e', 'ain', 'from', 'down', 'through', "shan't", 'other', 'isn', 'when', 're',
'under', "mightn't", "wasn't", "you're", 'not', 'can', "it's", 'him', "that'l
l", 'out', 'did', 'has', 'he', 'me', 'couldn', "don't", 'am', 'll', 't', 'abov
e', 'who', 'hadn', 'while', 'we', 'then', 'it', 'such', 'into', 'by', 'have',
'few', 'mightn', "couldn't", 'just', "aren't", 'your', 'nor', 'hasn', 'over',
'is', 'why', "should've", 'his', 'here', 'ma', 'her', 'd', 'herself', 'where'}

 length of stopwords set 179
******************************
```

Observation:

We found many redundancy in the data set and some of the Books data which does not make any sense here.

We dropped the almost 160K records in data de duplication step.

Text Preprocessing :

Removing Removing html tags

Removing Punctuation charcaters

Alphanumeric numbers

Length of words must be > 2

Uppercase to Lowercase

Removing the stop words

Using the Snowball Stemmer.

In [12]:
```
# Functions to clean the html tags and punctuation marks using Regular Expression.

def clean_htmlTags(sentence):
    pattern = re.compile('<.*?>')
    cleaned_text = re.sub(pattern , '' , sentence)
    return cleaned_text

def clean_punc(sentence):
    cleaned = re.sub(r'[!|#|,|?|\'|"]' , r' ' , sentence)
    cleaned = re.sub(r'[.|,|)|(|\|/]' ,r' ' , cleaned)
    return cleaned
```

In [13]:
```
#The below code will remove all the html tags , punctuation marks , uppercase to l
# are greater than 2 and are alphanumeric . Further we perform the Stemming of the

all_positive_words = []
all_negative_words = []
i = 0
str_temp = ' '
final_string = []
for sent in final['Text'].values:
    filtered_sentence=[]
    sent = clean_htmlTags(sent)
    for w in sent.split():
        for clean_word in clean_punc(w).split():
            if((clean_word.isalpha()) and (len(clean_word) > 2)):
                if(clean_word.lower() not in stop):
                    s = (sno.stem(clean_word.lower())).encode('utf-8')
                    filtered_sentence.append(s)
                    if((final['Score'].values)[i] == 'positive'):
                        all_positive_words.append(s)
                    if((final['Score'].values)[i] == 'negative'):
                        all_negative_words.append(s)
                else:
                    continue
            else:
                continue

    str_temp = b" ".join(filtered_sentence)
    final_string.append(str_temp)
    i+=1
```

In [14]:
```
#Now I have a final_string of list of each review and append it to the new columns

final['CleanedText'] = final_string
final['CleanedText'] = final['CleanedText'].str.decode('utf-8')
final.shape
```

Out[14]: (326808, 11)

In [15]:
```
#Making backup of th pre processed data for the future use:
final_backup = final
```

In [16]:
```

final_backup.shape #to use the dataframe in future if required
```

Out[16]: (326808, 11)

In [17]:
```
#Now lets take roughly same proportion of  each of positive and negative review fr
#the further data:
#We can process our next tasks with whole amount of the data but we are bounded wi


# To sample 80K points :

final_clean = final.iloc[:5000:]
print(final_clean.shape)
print(final_clean['Score'].value_counts())
```

```
(5000, 11)
1    4171
0     829
Name: Score, dtype: int64
```

In [18]:
```
#Sort the final data frame by timestamp values:
final_clean['Time'] = pd.to_datetime(final['Time'],unit='s')
final_clean = final_clean.sort_values(by='Time')
final_clean.shape
```

Out[18]: (5000, 11)

BAG OF WORDS:

In [19]:
```
# Creating the training data :
X = final_clean['CleanedText']
y = final_clean['Score']
print(X.shape , y.shape)
```

```
(5000,) (5000,)
```

In [20]:
```
# Computing the Train Vectorizer :
count_vect = CountVectorizer(ngram_range=(1,1) , min_df=10)
X_bow = count_vect.fit_transform(X)
print(X_bow.shape)
type(X_bow)
```

```
(5000, 1971)
```

Out[20]:
```
scipy.sparse.csr.csr_matrix
```

In [25]:
```
from wordcloud import WordCloud, STOPWORDS
stopwords = set(STOPWORDS)

def cluster_wordcloud(text):
    wordcloud = WordCloud(max_font_size=50, max_words=100,stopwords=stopwords ,bac
    plt.figure()
    plt.imshow(wordcloud, interpolation="bilinear")
    plt.axis("off")
    plt.show()
```

Agglomerative Clustering on BoW:

In [22]:
```
from sklearn.cluster import AgglomerativeClustering

n_cluster_list=[2,3,5]
text_reviews = final['Text'].values

for cluster in n_cluster_list:
    agg_clustering = AgglomerativeClustering(n_clusters = cluster , affinity = 'eu
    labels = agg_clustering.labels_
    print('*'*25 , "Agglomerative Clustering for Number of Clusters = ", cluster,

    for i in range(cluster):
        review_count = 1
        print('*'*100)
        print('Cluster-' , i + 1)
        print("*"*100)
        for j in range(labels.shape[0]):
            if labels[j] == i:
                if review_count == 3:
                    break
                else:
                    print('Review-',review_count ,',' , 'Review_Index' , j )
                    print(text_reviews[j])
                    cluster_wordcloud(text_reviews[j])
                    review_count+=1
```

```
************************* Agglomerative Clustering for Number of Clusters =  2
    *************************
****************************************************************************************
**********************
Cluster- 1
****************************************************************************************
**********************
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored p
acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia,
real fruit flavoring and no food coloring. Just colored with fruit or vegetabl
e colors. Pure and natural and tastes great. There are eight packets in a box
and only contains 10 calories per packet. Thank you Archer Farms!
```

```
Review- 2 , Review_Index 1
Our dogs just love them.  I saw them in a pet store and a tag was attached reg
arding them being made in China and it satisfied me that they were safe.
```

****
Cluster- 2
****
Review- 1 , Review_Index 131
These freeze dried treats are our dogs favorite treats. We've been spending D
OUBLE the price I paid for them at local area pet stores (ie, Chuck & Don's an
d PetSmart). Arrived promptly, well packaged. Highly recommended.

Review- 2 , Review_Index 145
Finally a treat both me and my puppy like. Doesn't have a strong odor, but dog
s still love them. Plus, as a freeze-dried treat they don't make your fingers
greasy.
A healthy treat that my puppy will actually eat!

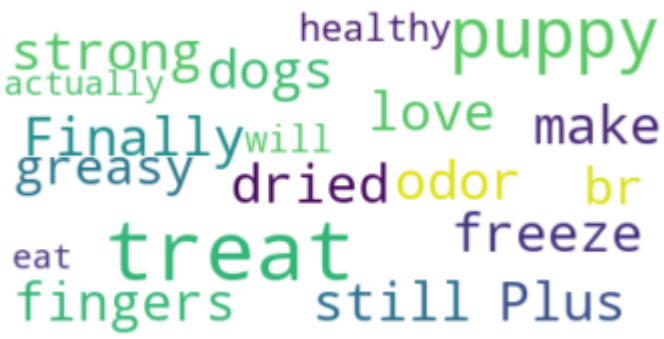
********** Agglomerative Clustering for Number of Clusters = 3 **********
****
Cluster- 1

****
****
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored packet with your 16 oz. water bottle. Contains the all natural sweetner Stev ia, real fruit flavoring and no food coloring. Just colored with fruit or ve getable colors. Pure and natural and tastes great. There are eight packets i n a box and only contains 10 calories per packet. Thank you Archer Farms!

Review- 2 , Review_Index 1
Our dogs just love them. I saw them in a pet store and a tag was attached reg arding them being made in China and it satisfied me that they were safe.

****
****
Cluster- 2
****
****
Review- 1 , Review_Index 131
These freeze dried treats are our dogs favorite treats. We've been spending D OUBLE the price I paid for them at local area pet stores (ie, Chuck & Don's an d PetSmart). Arrived promptly, well packaged. Highly recommended.

Review- 2 , Review_Index 145
Finally a treat both me and my puppy like. Doesn't have a strong odor, but dog s still love them. Plus, as a freeze-dried treat they don't make your fingers greasy.
A healthy treat that my puppy will actually eat!



****
Cluster- 3
****
Review- 1 , Review_Index 223
Just wanted to post a correction to what the previous review said...

The film is NOT based on the cartoon it's the other way around. The cartoon came later.

Review- 2 , Review_Index 563
After battling fleas this summer and wanting to know if I had things under c ontrol, I purchased 2 flea traps, this one and the Springstar one to see whi ch was the better flea trap.

First, the light is very bright so i f you plan on using this in a bedroom keep that in mind. It would be better

suited to going under the bed.

Second, the main difference betwee
n the 2 traps is the amount of open space for fleas to get trapped. This tra
p has a large open space to catch more fleas, and the Spingstar has a smalle
r grid that traps less fleas. The trade off is, the Springstar is more aesth
etically pleasing. That trap hides the trapped fleas better under a grid pie
ce, and kids and pets can't get to the sticky pad. With this trap smaller ch
ildren could easily reach inside, so again, something to keep in mind.

Third, when assembling this trap the sticky pad was curved in the box.
This meant that the pad refused to lay flat in the trap. A small problem tha
t could be fixed with tape if need be.

Overall this trap is a goo
d investment. I have had it set up for a little over a week now and have cau
ght 2 adult fleas and gnats. This is a cost effective way to see if you have
your flea infestation under control while not using chemicals. Since adult f
leas can emerge from pupas months after an infestation it's far better to lu
re them to a trap to die then let them bite your animals.

If yo
u're choosing between this and the Springstar it boils down to a matter of p
ersonal preference. If you plan to leave the trap out for people to see, go
with the Spingstar. If you want a large, industrial type trap, go with this
one. Both caught pretty good amounts of fleas and lots of gnats.

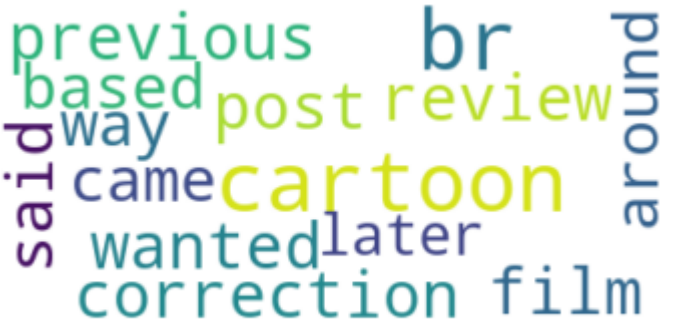
********** Agglomerative Clustering for Number of Clusters = 5
****
****
****
Cluster- 1
****
****
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored p
acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia,
real fruit flavoring and no food coloring. Just colored with fruit or vegetabl
e colors. Pure and natural and tastes great. There are eight packets in a box
and only contains 10 calories per packet. Thank you Archer Farms!

Review- 2 , Review_Index 1
Our dogs just love them. I saw them in a pet store and a tag was attached reg
arding them being made in China and it satisfied me that they were safe.

****
****
Cluster- 2
****
****
Review- 1 , Review_Index 131
These freeze dried treats are our dogs favorite treats. We've been spending D
OUBLE the price I paid for them at local area pet stores (ie, Chuck & Don's an
d PetSmart). Arrived promptly, well packaged. Highly recommended.

Review- 2 , Review_Index 145
Finally a treat both me and my puppy like. Doesn't have a strong odor, but dog
s still love them. Plus, as a freeze-dried treat they don't make your fingers
greasy.
A healthy treat that my puppy will actually eat!

```
**************************************************************************************************************
Cluster- 3
**************************************************************************************************************
Review- 1 , Review_Index 223
Just wanted to post a correction to what the previous review said...<br /><br />The film is NOT based on the cartoon it's the other way around. The cartoon came later.
```




```
Review- 2 , Review_Index 563
After battling fleas this summer and wanting to know if I had things under control, I purchased 2 flea traps, this one and the Springstar one to see which was the better flea trap.<br /><br />First, the light is very bright so if you plan on using this in a bedroom keep that in mind. It would be better suited to going under the bed.<br /><br />Second, the main difference between the 2 traps is the amount of open space for fleas to get trapped. This trap has a large open space to catch more fleas, and the Spingstar has a smaller grid that traps less fleas. The trade off is, the Springstar is more aesthetically pleasing. That trap hides the trapped fleas better under a grid piece, and kids and pets can't get to the sticky pad. With this trap smaller children could easily reach inside, so again, something to keep in mind.<br /><br />Third, when assembling this trap the sticky pad was curved in the box. This meant that the pad refused to lay flat in the trap. A small problem that could be fixed with tape
```

if need be.

Overall this trap is a good investment. I have had it s et up for a little over a week now and have caught 2 adult fleas and gnats. Th is is a cost effective way to see if you have your flea infestation under cont rol while not using chemicals. Since adult fleas can emerge from pupas months after an infestation it's far better to lure them to a trap to die then let th em bite your animals.

If you're choosing between this and the Sprin gstar it boils down to a matter of personal preference. If you plan to leave t he trap out for people to see, go with the Spingstar. If you want a large, ind ustrial type trap, go with this one. Both caught pretty good amounts of fleas and lots of gnats.

****
Cluster- 4
****
Review- 1 , Review_Index 97
Freeze dried liver has a hypnotic effect on dogs. They LOVE it and will do ju st about anything for it, so it is a great treat to use for training. (Powder ed freeze dried liver is even added to many dog medicines nowadays-- heartworm and arthritis tablets, etc.-- because it causes the dog to scarf the medicine down like a treat.)

Freeze dried liver has a dry, hard, yet powder y/easy to chew consistency. It comes chopped/cubed. It is extremely lightwei ght due to the fact there is so little moisture in the product (thus the low w eights on product labels).

Even though your dog will love liver tre ats, you shouldn't overfeed it. The manufacturer recommends 1-2 cubes daily f or small dogs, 2-3 cubes for medium dogs, and 3-4 cubes for large dogs.

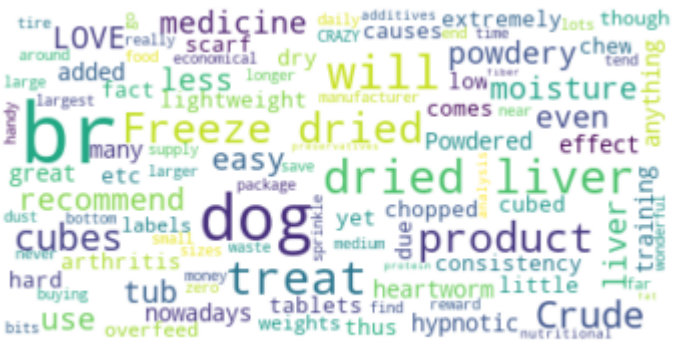
The largest package sizes of liver treats tend to be far more economical. I recommend buying the larger tubs, as you will save lots of money, you'll h ave a handy treat supply around for a longer time, and your dog will never tir e of this product.

There is really zero waste with this product. W hen you near the end of the tub you'll find some powdery bits of dried liver a t the bottom. Your dogs will go CRAZY if you sprinkle this dust over their do g food-- it's a wonderful reward that is easy to use.

~~~~~~~~~~~~~~~~~~~
Here's the nutritional analysis:

-100% freeze dried live r
-NO additives or preservatives.

-Crude protein..... not less than 50%
-Crude fat..... not less than 5%
-Crude fiber..... not mo re than 3%
-Moisture..... not more than 6%



Review- 2 , Review_Index 142
Gold standard for training treats. Have used for 10 years of training. Never m
et a dog that didn't love them. Fast easy service thru Amazon sellers.

****
****
Cluster- 5
****
****
Review- 1 , Review_Index 10
This is the only dog treat that my terrier will eat. We crumble over his dry f
ood and he LOVES it.

```
Review- 2 , Review_Index 55
I have a 2 1/2 year old black lab and these are her favorite treats! They are
the best for training, my dog will do just about anything to get one of these
treats. Even my 3 month old black lab puppy goes running to his kennel when I
tell him to go to bed because he knows that a liver treat is coming his way. S
ince they are sliced small a large container of these will last a while. The o
nly complaint I have is that my dog loves these so much that if she knows shes
getting one she starts to drool, and she's not a drooler... So I gotta toss on
e to her quick!!
```

Agglomerative Clustering on TF-idf vector :

In [23]:
```
#Uni Gram  Train dataset Tf-IDF Vector:
tfidf_vector = TfidfVectorizer(min_df=10 )
X_tfidf= tfidf_vector.fit_transform(X)

print('X_tfidf.get_shape() : ' , X_tfidf.get_shape())
```

```
X_tfidf.get_shape() :  (5000, 1971)
```

In [24]:
```
from sklearn.cluster import AgglomerativeClustering

n_cluster_list=[2,3,5]
text_reviews = final['Text'].values

for cluster in n_cluster_list:
    agg_clustering = AgglomerativeClustering(n_clusters = cluster , affinity = 'eu
    labels = agg_clustering.labels_
    print('*'*30 , "Agglomerative Clustering for the Number of Clusters = ", clust

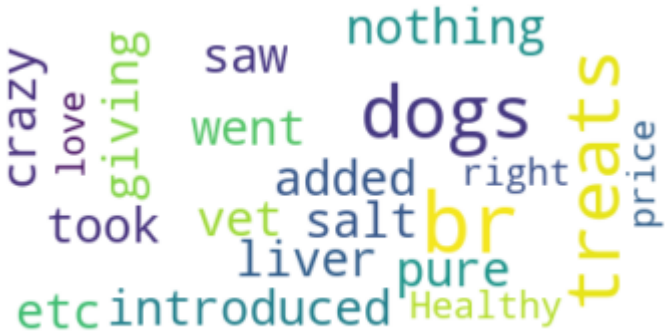
    for i in range(cluster):
        review_count = 1
        print('*'*100)
        print('Cluster-' , i + 1)
        print("*"*100)
        for j in range(labels.shape[0]):
            if labels[j] == i:
                if review_count == 3:
                    break
                else:
                    print('Review-',review_count ,',' , 'Review_Index' , j )
                    print(text_reviews[j])
                    cluster_wordcloud(text_reviews[j])
                    review_count+=1
```

```
****************************** Agglomerative Clustering for the Number of Clus
ters =  2    ******************************
****************************************************************************************
**********
Cluster- 1
****************************************************************************************
**********
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored p
acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia,
real fruit flavoring and no food coloring. Just colored with fruit or vegetabl
e colors. Pure and natural and tastes great. There are eight packets in a box
and only contains 10 calories per packet. Thank you Archer Farms!
```

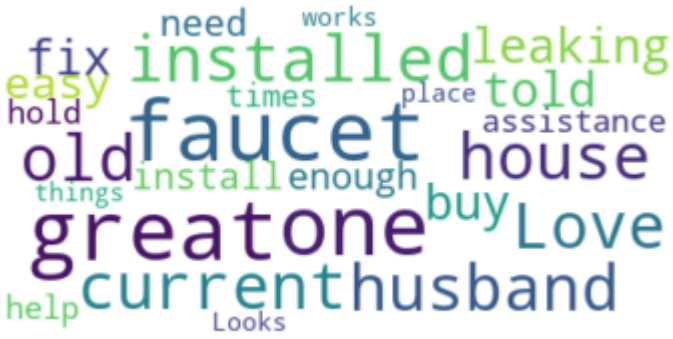
```
Review- 2 , Review_Index 1
Our dogs just love them.  I saw them in a pet store and a tag was attached reg
arding them being made in China and it satisfied me that they were safe.
```

****
Cluster- 2
****
Review- 1 , Review_Index 68
I was introduced to these treats when I took my dogs to the vet, and saw her g iving them these treats.
The dogs went crazy for them!
Not only tha t, but there is nothing in this but pure liver. No added salt, etc....

Healthy treats that my dogs love. And the price is right, too!



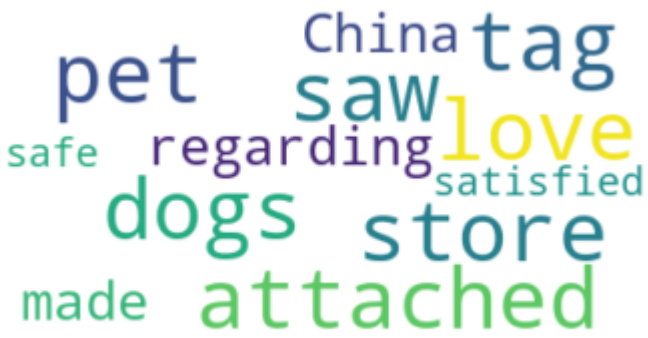
Review- 2 , Review_Index 95
Love this faucet. My husband had installed the same one in our old house so w hen our current faucet was leaking I told him not to fix it and we would buy t he same one. It was easy enough for him to install but he did need my assista nce a few times to help hold some things in place. Looks great and works grea t.



********** Agglomerative Clustering for the Number of Cl usters = 3   **********

****
Cluster- 1
****
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored packet with your 16 oz. water bottle. Contains the all natural sweetner Stev ia, real fruit flavoring and no food coloring. Just colored with fruit or ve getable colors. Pure and natural and tastes great. There are eight packets i n a box and only contains 10 calories per packet. Thank you Archer Farms!

Review- 2 , Review_Index 1
Our dogs just love them. I saw them in a pet store and a tag was attached reg arding them being made in China and it satisfied me that they were safe.



****
Cluster- 2
****
Review- 1 , Review_Index 68
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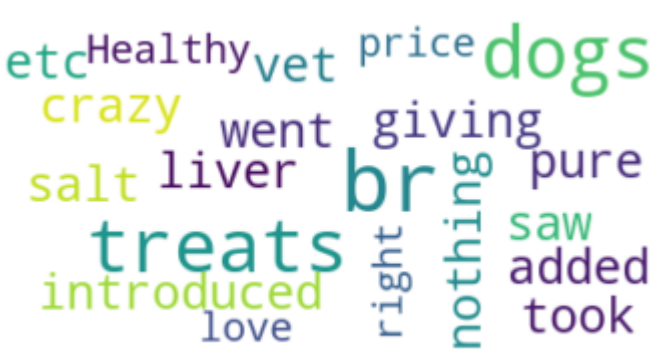
The dogs went crazy for them!
Not only tha t, but there is nothing in this but pure liver. No added salt, etc....

Healthy treats that my dogs love. And the price is right, too!



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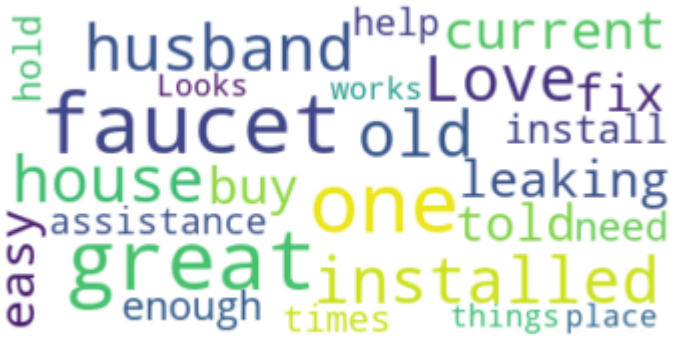
hen our current faucet was leaking I told him not to fix it and we would buy t
he same one. It was easy enough for him to install but he did need my assista
nce a few times to help hold some things in place. Looks great and works grea
t.



****
Cluster- 3
****
Review- 1 , Review_Index 6
This was the only treat my dog liked during obedience training and it has rema
ined her favorite ever since. I haven't met a dog that didn't like this trea
t!

Review- 2 , Review_Index 7
No waste , even if she is having a day when she goes on a hunger strike she

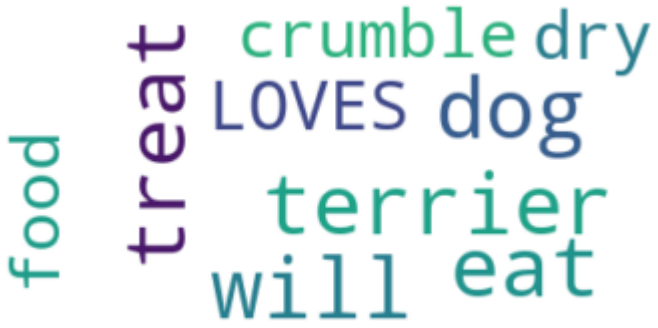
always room for one or 2 or 3 of these and the extra powder on bottom makes a

********** Agglomerative Clustering for the Number of Clusters = 5 **********
****
Cluster- 1
****
Review- 1 , Review_Index 6
This was the only treat my dog liked during obedience training and it has remained her favorite ever since. I haven't met a dog that didn't like this treat!

Review- 2 , Review_Index 7
No waste , even if she is having a day when she goes on a hunger strike she always room for one or 2 or 3 of these and the extra powder on bottom makes a real treat on food , Never met a pooch that did not go crazy over her treats !

****
Cluster- 2
****
Review- 1 , Review_Index 5
This is the ONLY dog treat that my Lhasa Apso will eat. It makes me happ becua se it has NO added ingredients or preservatives, as well as NO ADDED SALT! Thi s is the ONLY dog treat that my Vet approves of!

Review- 2 , Review_Index 10
This is the only dog treat that my terrier will eat. We crumble over his dry f ood and he LOVES it.



****
Cluster- 3
****
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored p

acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia, real fruit flavoring and no food coloring. Just colored with fruit or vegetabl e colors. Pure and natural and tastes great. There are eight packets in a box and only contains 10 calories per packet. Thank you Archer Farms!

Review- 2 , Review_Index 1
Our dogs just love them. I saw them in a pet store and a tag was attached reg arding them being made in China and it satisfied me that they were safe.

****
Cluster- 4
****
Review- 1 , Review_Index 68
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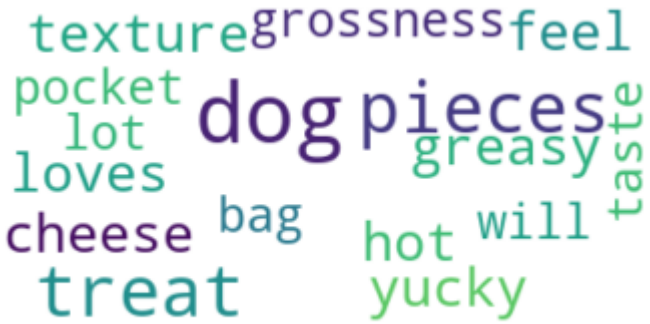
The dogs went crazy for them!
Not only tha t, but there is nothing in this but pure liver. No added salt, etc....

Healthy treats that my dogs love. And the price is right, too!

Review- 2 , Review_Index 95
Love this faucet. My husband had installed the same one in our old house so when our current faucet was leaking I told him not to fix it and we would bu y the same one. It was easy enough for him to install but he did need my as sistance a few times to help hold some things in place. Looks great and work s great.

****
Cluster- 5
****
Review- 1 , Review_Index 71
My dog loves these and so do I :). No yucky texture or greasy feel such as w ith hot dog pieces or cheese pieces and no grossness in your pocket or treat b ag. And my dog will do a lot for a taste of these treats.



Review- 2 , Review_Index 73
When I first go my Havanese puppy 1 1/2 years ago, the breeder suggested these liver treats for using when training. My dog will do ANYTHING for these treat s. They even use them at the name brand pet hotel we use in Phoenix. You hav e to be careful not to give too much, but my dog, Tanner, got over his separat ion anxiety when I started the routine of asking for a kiss, then giving him a treat and then leaving. Now he just wants the treat, I have to beg for the ki ss.

Word2Vec

In [20]:
```
# Lets compute a list of words for Train Data to compute the word2vec:
# Now we will Train our own model using Word2vec:
list_of_sentence=[]
for sent in X:
    list_of_sentence.append(sent.split())

print(list_of_sentence[0])
```

```
['beetlejuic', 'well', 'written', 'movi', 'everyth', 'excel', 'act', 'specia
l', 'effect', 'delight', 'chose', 'view', 'movi']
```

In [21]:
```
# Creating the gensim model
import gensim
import warnings
warnings.filterwarnings('ignore')

model = gensim.models.Word2Vec(list_of_sentence , min_count=5 , size=200 , workers
vocab_list = list(model.wv.vocab)
```

In [22]:
```
#Computing the Average word2vec for Data:
sent_vect= [] #this will hold the all values of the vectors of each words
for sen in tqdm(list_of_sentence):
    sen_vec = np.zeros(200)
    word_count=0
    for word in sen:
        if word in vocab_list:
            vector_of_current_word = model.wv[word]
            sen_vec+=vector_of_current_word
            word_count+=1
    if word_count != 0:
        sen_vec/=word_count
    sent_vect.append(sen_vec)

print(len(sent_vect))

print(len(sent_vect[0]))
```

```
100%|████████████████████████████████████| 5000/5000 [00:18<00:00, 266.15it/
s]

5000
200
```

In [23]:
```
sent_vect = np.array(sent_vect)
type(sent_vect)
```

Out[23]: numpy.ndarray

In [26]:
```
from sklearn.cluster import AgglomerativeClustering

n_cluster_list=[2,3,5]
text_reviews = final['Text'].values

for cluster in n_cluster_list:
    agg_clustering = AgglomerativeClustering(n_clusters = cluster , affinity = 'eu
    labels = agg_clustering.labels_
    print('*'*25 , "Agglomerative Clustering for Number of Clusters = ", cluster,

    for i in range(cluster):
        review_count = 1
        print('*'*100)
        print('Cluster-' , i + 1)
        print("*"*100)
        for j in range(labels.shape[0]):
            if labels[j] == i:
                if review_count == 3:
                    break
                else:
                    print('Review-',review_count ,',' , 'Review_Index' , j )
                    print(text_reviews[j])
                    cluster_wordcloud(text_reviews[j])
                    review_count+=1
```

```
************************* Agglomerative Clustering for Number of Clusters =  2
    *************************
****************************************************************************************
**********************
Cluster- 1
****************************************************************************************
**********************
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored p
acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia,
real fruit flavoring and no food coloring. Just colored with fruit or vegetabl
e colors. Pure and natural and tastes great. There are eight packets in a box
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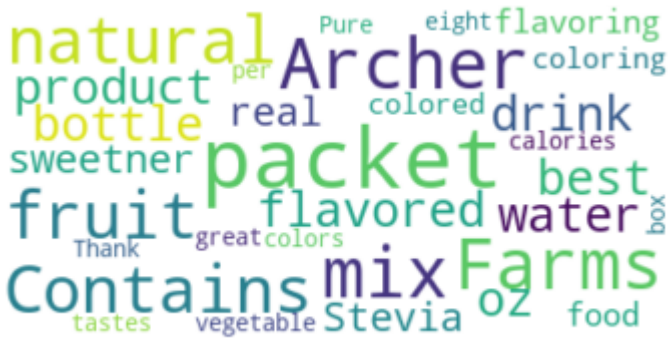
```




```
Review- 2 , Review_Index 1
Our dogs just love them.  I saw them in a pet store and a tag was attached reg
arding them being made in China and it satisfied me that they were safe.
```

****
Cluster- 2
****
Review- 1 , Review_Index 21
Freeze dried liver has a hypnotic effect on dogs. They LOVE it and will do jus t about anything for it, so it is a great treat to use for training. (Powdered freeze dried liver is even added to many dog medicines nowadays-- heartworm an d arthritis tablets, etc.-- because it causes the dog to scarf the medicine do wn like a treat.)

Freeze dried liver has a dry, hard, yet powdery/e asy to chew consistency. It comes chopped/cubed. It is extremely lightweight d ue to the fact there is so little moisture in the product (thus the low weight s on product labels).

Even though your dog will love liver treats, you shouldn't overfeed it. The manufacturer recommends 1-2 cubes daily for sma ll dogs, 2-3 cubes for medium dogs, and 3-4 cubes for large dogs.

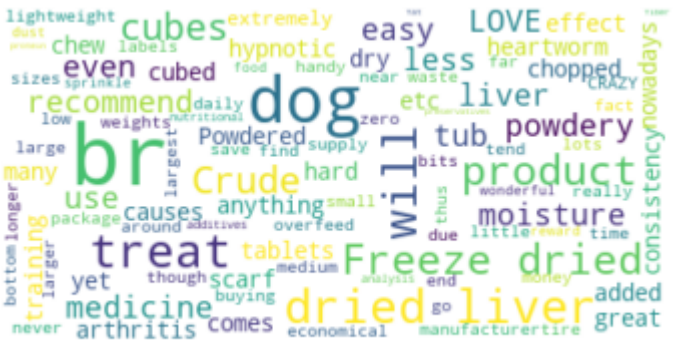
T he largest package sizes of liver treats tend to be far more economical. I rec ommend buying the larger tubs, as you will save lots of money, you'll have a h andy treat supply around for a longer time, and your dog will never tire of th is product.

There is really zero waste with this product. When you near the end of the tub you'll find some powdery bits of dried liver at the bo ttom. Your dogs will go CRAZY if you sprinkle this dust over their dog food-- it's a wonderful reward that is easy to use.

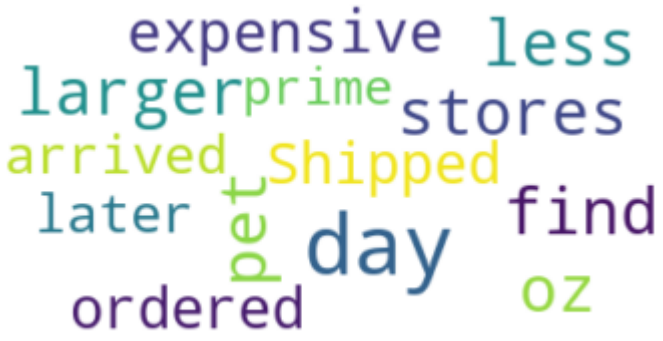
~~~~~~~~~~~~~~~~~~
Here's the nutritional analysis:

-100% freeze dried liver
-N O additives or preservatives.

-Crude protein..... not less than 50%
-Crude fat..... not less than 5%
-Crude fiber..... not more than 3%
-Moisture..... not more than 6%



Review- 2 , Review_Index 34
This is 2.5 oz larger than what you can find in pet stores and less expensive. Shipped day the it was ordered and arrived 2 days later with prime.



********** Agglomerative Clustering for Number of Clusters = 3 **********

****

Cluster- 1

****

Review- 1 , Review_Index 0

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Review- 2 , Review_Index 1

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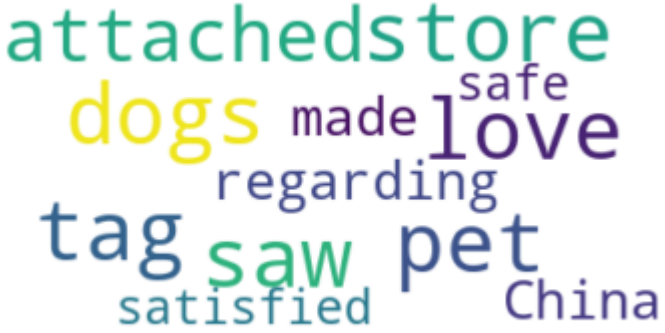

****

****
Cluster- 2
****
****
Review- 1 , Review_Index 21
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~~~~~~~~~~~~~~~~~~
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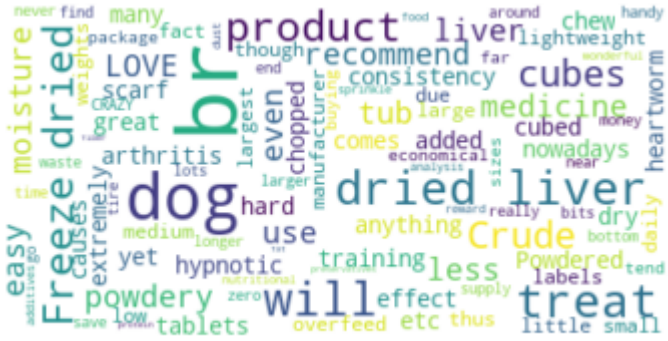

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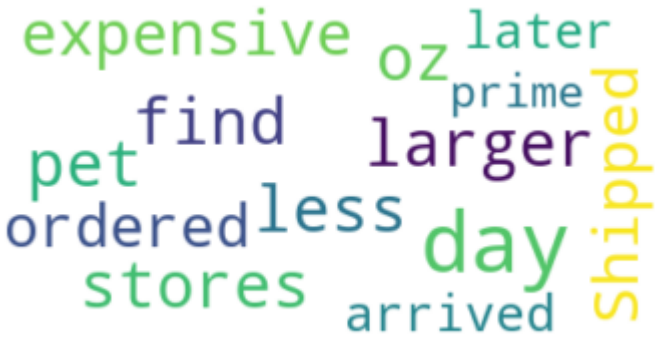

```
**************************************************************************************************
Cluster- 3
**************************************************************************************************
Review- 1 , Review_Index 5
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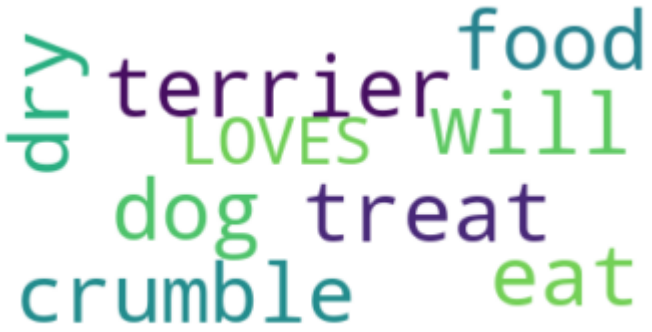
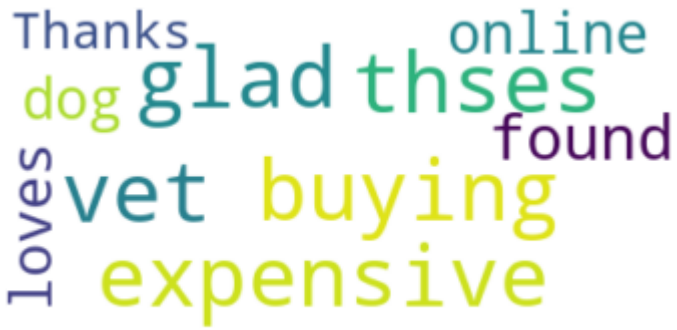
se it has NO added ingredients or preservatives, as well as NO ADDED SALT! Thi
s is the ONLY dog treat that my Vet approves of!
```

```
Review- 2 , Review_Index 10
This is the only dog treat that my terrier will eat. We crumble over his dry f
ood and he LOVES it.
```




```
************************ Agglomerative Clustering for Number of Clusters =
5    ************************
**************************************************************************************************
************************
Cluster- 1
**************************************************************************************************
************************
Review- 1 , Review_Index 11
New puppy loves this, only treat he will pay attention to while walking and
training. One note, pieces are quite large so I cut them up into smaller pie
ces so their recommended daily amount goes further.<br /><br />All the dogs
in the dog park can't resist my pocket when I have these treats. Usually sur
rounded by a crowd of dogs all poking at my pocket.
```

Review- 2 , Review_Index 14
We were buying thses from our vet, but they are so expensive. So glad we found them online. Our dog loves these! Thanks!



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Cluster- 2
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****
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored p acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia, real fruit flavoring and no food coloring. Just colored with fruit or vegetabl e colors. Pure and natural and tastes great. There are eight packets in a box and only contains 10 calories per packet. Thank you Archer Farms!

Review- 2 , Review_Index 1
Our dogs just love them. I saw them in a pet store and a tag was attached reg
arding them being made in China and it satisfied me that they were safe.

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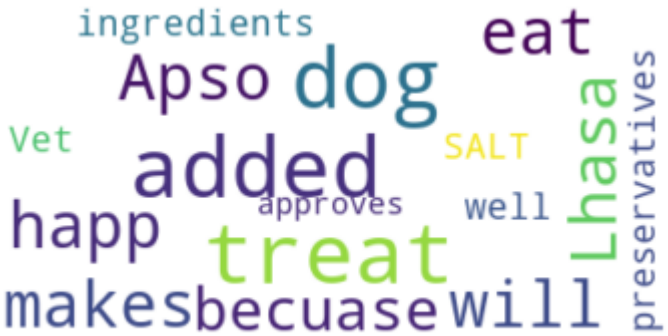
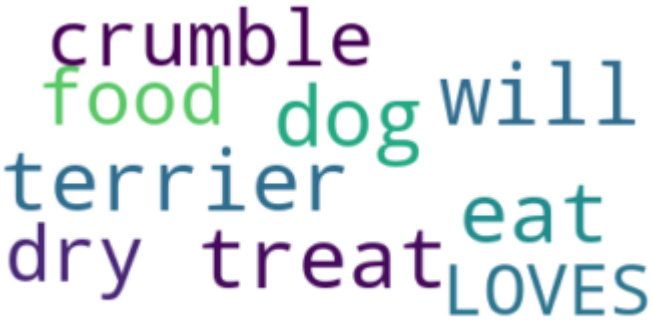
Cluster- 3
****
****
Review- 1 , Review_Index 5
This is the ONLY dog treat that my Lhasa Apso will eat. It makes me happ becua
se it has NO added ingredients or preservatives, as well as NO ADDED SALT! Thi
s is the ONLY dog treat that my Vet approves of!



Review- 2 , Review_Index 10
This is the only dog treat that my terrier will eat. We crumble over his dry f
ood and he LOVES it.



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Cluster- 4
****
Review- 1 , Review_Index 21
Freeze dried liver has a hypnotic effect on dogs. They LOVE it and will do jus t about anything for it, so it is a great treat to use for training. (Powdered freeze dried liver is even added to many dog medicines nowadays-- heartworm an d arthritis tablets, etc.-- because it causes the dog to scarf the medicine do wn like a treat.)

Freeze dried liver has a dry, hard, yet powdery/e asy to chew consistency. It comes chopped/cubed. It is extremely lightweight d ue to the fact there is so little moisture in the product (thus the low weight s on product labels).

Even though your dog will love liver treats, you shouldn't overfeed it. The manufacturer recommends 1-2 cubes daily for sma ll dogs, 2-3 cubes for medium dogs, and 3-4 cubes for large dogs.

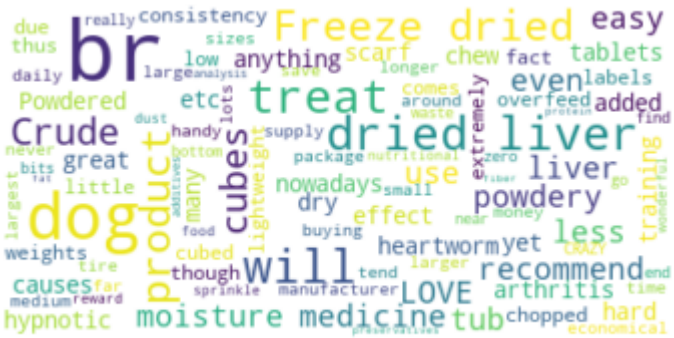
T he largest package sizes of liver treats tend to be far more economical. I rec ommend buying the larger tubs, as you will save lots of money, you'll have a h andy treat supply around for a longer time, and your dog will never tire of th is product.

There is really zero waste with this product. When you near the end of the tub you'll find some powdery bits of dried liver at the bo ttom. Your dogs will go CRAZY if you sprinkle this dust over their dog food-- it's a wonderful reward that is easy to use.

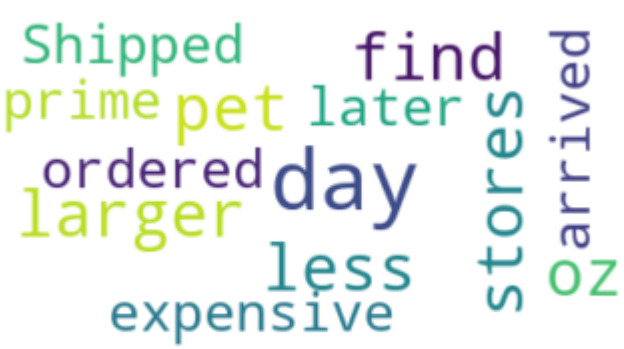
~~~~~~~~~~~~~~~~~~
Here's the nutritional analysis:

-100% freeze dried liver
-N O additives or preservatives.

-Crude protein..... not less than 50%
-Crude fat..... not less than 5%
-Crude fiber..... not more than 3%
-Moisture..... not more than 6%



Review- 2 , Review_Index 34
This is 2.5 oz larger than what you can find in pet stores and less expensive. Shipped day the it was ordered and arrived 2 days later with prime.



****
Cluster- 5
****
Review- 1 , Review_Index 148
I was pet sitting recently and the dog I was sitting for had these in her trea t pouch. She loved them so I tried them with my dogs. All 3 dogs were quite we ll-behaved whenever they saw me reach for these goodies. My son and I jokingly call them "doggie crack". They're good for them, they work as training tools, what else can you ask for in a dog treat?

Review- 2 , Review_Index 154
I selected this company over the other even though the price was higher. I was hoping the pieces would be more consistent in size. It tuened out the containe r was filled with smaller crum like pieces, worse than the other company's. I will never buy anything from this company.

TF-idf W2vec :

In [27]:
```
#Computing the TF-idf values for the Train Data:
tfidf_model = TfidfVectorizer()
tf_idf_matrix = tfidf_model.fit_transform(X)

# we are converting a dictionary with word as a key, and the tfidf as a value
dictionary = dict(zip(tfidf_model.get_feature_names(), list(tfidf_model.idf_)))
```

In [28]:
```
# Creating the gensim model
model = gensim.models.Word2Vec(list_of_sentence , min_count=5 , size=200 , workers
vocab_list = list(model.wv.vocab)
```

In [29]:
```
# TF-IDF weighted Word2Vec
tfidf_feat = tfidf_model.get_feature_names() # tfidf words/col-names
# final_tf_idf is the sparse matrix with row= sentence, col=word and cell_val = tf

tfidf_sent_vectors = []; # the tfidf-w2v for each sentence/review is stored in thi
row=0;
for sent in tqdm(list_of_sentence): # for each review/sentence
    sent_vec = np.zeros(200) # as word vectors are of zero length
    weight_sum =0; # num of words with a valid vector in the sentence/review
    for word in sent: # for each word in a review/sentence
        if word in vocab_list:
            vec = model.wv[word]
            tf_idf = dictionary[word]*sent.count(word)
            sent_vec += (vec * tf_idf)
            weight_sum += tf_idf
    if weight_sum != 0:
        sent_vec /= weight_sum
    tfidf_sent_vectors.append(sent_vec)
    row += 1

print('\n' , len(tfidf_sent_vectors))

print(len(tfidf_sent_vectors[0]))
```

```
100%|██████████████████████████████████| 5000/5000 [00:16<00:00, 301.28it/
s]


 5000
200
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In [30]:
```
#Converting the type of tfidf_sent_vectors_train to ndarray:
tfidf_sent_vectors = np.array(tfidf_sent_vectors)
type(tfidf_sent_vectors)
```

Out[30]: numpy.ndarray

In [31]:
```
from sklearn.cluster import AgglomerativeClustering

n_cluster_list=[2,3,5]
text_reviews = final['Text'].values

for cluster in n_cluster_list:
    agg_clustering = AgglomerativeClustering(n_clusters = cluster , affinity = 'eu
    labels = agg_clustering.labels_
    print('*'*25 , "Agglomerative Clustering for Number of Clusters = ", cluster,

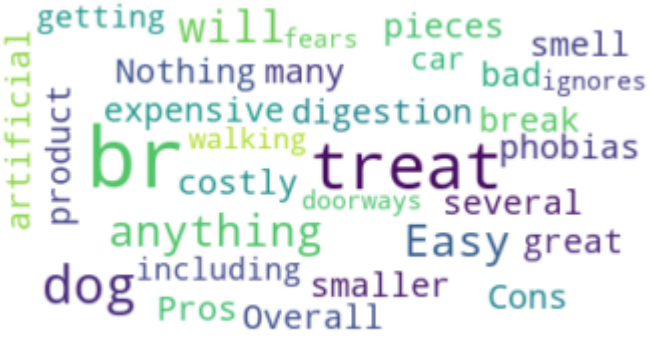
    for i in range(cluster):
        review_count = 1
        print('*'*100)
        print('Cluster-' , i + 1)
        print("*"*100)
        for j in range(labels.shape[0]):
            if labels[j] == i:
                if review_count == 3:
                    break
                else:
                    print('Review-',review_count ,',' , 'Review_Index' , j )
                    print(text_reviews[j])
                    cluster_wordcloud(text_reviews[j])
                    review_count+=1
```

```
************************* Agglomerative Clustering for Number of Clusters =  2
    *************************
****************************************************************************************
**********************
Cluster- 1
****************************************************************************************
**********************
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored p
acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia,
real fruit flavoring and no food coloring. Just colored with fruit or vegetabl
e colors. Pure and natural and tastes great. There are eight packets in a box
and only contains 10 calories per packet. Thank you Archer Farms!
```

```
Review- 2 , Review_Index 1
Our dogs just love them.  I saw them in a pet store and a tag was attached reg
arding them being made in China and it satisfied me that they were safe.
```

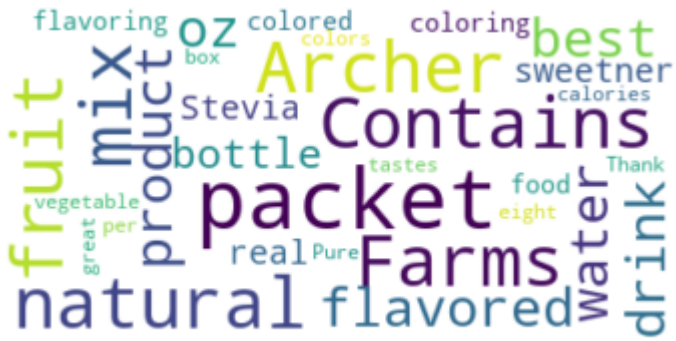
****
Cluster- 2
****
Review- 1 , Review_Index 60
Pros:
Dog will do anything for this treat.
Doesn't smell as bad as m
any other treats.
Easy to break into smaller pieces.
Nothing artific
ial, easy digestion.

Cons:
More costly than other dog treats.<
br />
Overall, this is a great product. While more expensive, my dog will
do anything for this treat. He has several phobias, including getting in and o
ut of the car, and walking through doorways, but he ignores all of his fears t
o get to this treat.



Review- 2 , Review_Index 68
I was introduced to these treats when I took my dogs to the vet, and saw her g
iving them these treats.
The dogs went crazy for them!
Not only tha
t, but there is nothing in this but pure liver. No added salt, etc....
<
br />Healthy treats that my dogs love. And the price is right, too!

```
************************ Agglomerative Clustering for Number of Clusters = 3    ************************
************************************************************************************************************************
Cluster- 1
************************************************************************************************************************
Review- 1 , Review_Index 0
This product by Archer Farms is the best drink mix ever. Just mix a flavored packet with your 16 oz. water bottle. Contains the all natural sweetner Stevia, real fruit flavoring and no food coloring. Just colored with fruit or vegetable colors. Pure and natural and tastes great. There are eight packets in a box and only contains 10 calories per packet. Thank you Archer Farms!
```



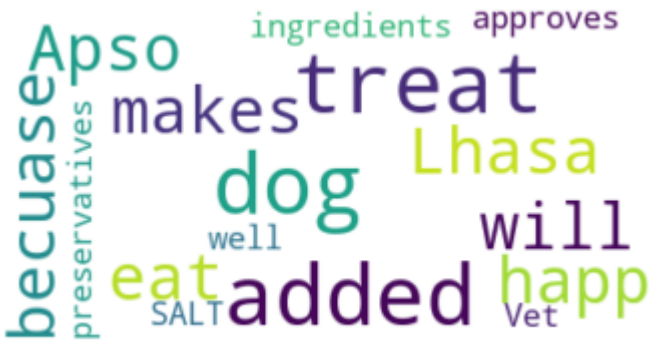

```
Review- 2 , Review_Index 1
Our dogs just love them.  I saw them in a pet store and a tag was attached regarding them being made in China and it satisfied me that they were safe.
```

```
************************************************************************************************************************
Cluster- 2
************************************************************************************************************************
Review- 1 , Review_Index 60
Pros:<br />Dog will do anything for this treat.<br />Doesn't smell as bad as many other treats.<br />Easy to break into smaller pieces.<br />Nothing artificial, easy digestion.<br /><br />Cons:<br />More costly than other dog treats.<br /><br />Overall, this is a great product. While more expensive, my dog will do anything for this treat. He has several phobias, including getting in and out of the car, and walking through doorways, but he ignores all of his fears to get to this treat.
```

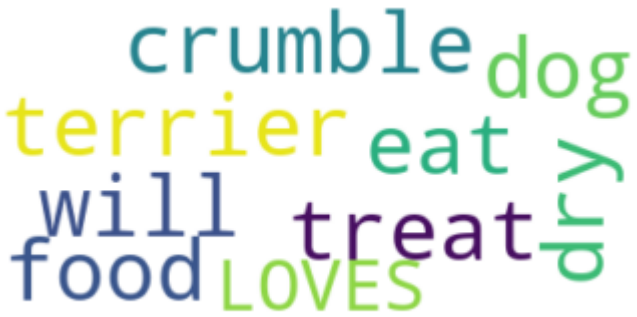
Review- 2 , Review_Index 68
I was introduced to these treats when I took my dogs to the vet, and saw her g iving them these treats.
The dogs went crazy for them!
Not only tha t, but there is nothing in this but pure liver. No added salt, etc....

Healthy treats that my dogs love. And the price is right, too!

****
Cluster- 3
****
Review- 1 , Review_Index 5
This is the ONLY dog treat that my Lhasa Apso will eat. It makes me happ becua se it has NO added ingredients or preservatives, as well as NO ADDED SALT! Thi s is the ONLY dog treat that my Vet approves of!



Review- 2 , Review_Index 10
This is the only dog treat that my terrier will eat. We crumble over his dry f ood and he LOVES it.



********** Agglomerative Clustering for Number of Clusters = 5 **********

****

Cluster- 1

****

Review- 1 , Review_Index 0

This product by Archer Farms is the best drink mix ever. Just mix a flavored p acket with your 16 oz. water bottle. Contains the all natural sweetner Stevia, real fruit flavoring and no food coloring. Just colored with fruit or vegetabl e colors. Pure and natural and tastes great. There are eight packets in a box and only contains 10 calories per packet. Thank you Archer Farms!

Review- 2 , Review_Index 1

Our dogs just love them. I saw them in a pet store and a tag was attached reg arding them being made in China and it satisfied me that they were safe.

****

****
Cluster- 2
****
****
Review- 1 , Review_Index 145
Finally a treat both me and my puppy like. Doesn't have a strong odor, but dog s still love them. Plus, as a freeze-dried treat they don't make your fingers greasy.
A healthy treat that my puppy will actually eat!

Review- 2 , Review_Index 159
This sly trap is attractive to look at, works well, and has no odor. I recomme nd it!

****
****
Cluster- 3
****
****
Review- 1 , Review_Index 5
This is the ONLY dog treat that my Lhasa Apso will eat. It makes me happ becua se it has NO added ingredients or preservatives, as well as NO ADDED SALT! Thi s is the ONLY dog treat that my Vet approves of!

Review- 2 , Review_Index 10
This is the only dog treat that my terrier will eat. We crumble over his dry f
ood and he LOVES it.

****
****
Cluster- 4
****
****
Review- 1 , Review_Index 60
Pros:
Dog will do anything for this treat.
Doesn't smell as bad as m
any other treats.
Easy to break into smaller pieces.
Nothing artific
ial, easy digestion.

Cons:
More costly than other dog treats.<
br />
Overall, this is a great product. While more expensive, my dog will
do anything for this treat. He has several phobias, including getting in and o
ut of the car, and walking through doorways, but he ignores all of his fears t
o get to this treat.

Review- 2 , Review_Index 68
I was introduced to these treats when I took my dogs to the vet, and saw her giving them these treats.
The dogs went crazy for them!
Not only t hat, but there is nothing in this but pure liver. No added salt, etc....

Healthy treats that my dogs love. And the price is right, too!

****
Cluster- 5
****
Review- 1 , Review_Index 92
ALL I DO IS SHAKE THIS CONTAINER AND MY DOG COMES RUNNING. SHE HAS HAD FOR OVE R A YEAR AND PREFERS TO ALL TREATS AND FOOD. I FEEL GREAT AS THEY ARE GOOD FOR HER. THE PRICE SEEMS HEFTY BUT YOU CAN CUT THE PIECES UP EVEN THOUGH FREEZE DR IED. OUR FAV DOG TREAT FOR SURE. MAKES YOU FEEL GREAT TO GIVE YOUR PUP A EXCEL LENT SOURCE OF ALL NUTRIENTS THEY LOVE. I FEEL LIKE I'M TRICKING HER.

Review- 2 , Review_Index 94
Gimborn Freeze Dried Treats 21 oz Beef Liver is one of my dog's favorite treat s, so I was happy to find them in a large size container. I received my order very quickly, and was happy with the service I received.

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favorite
Dried
find
Treats
one
order
service
Gimborn
happy
dog
Beef
size
quickly
received
Liver
container
large
Freeze