INDIAN INSTITUTE OF TECHNOLOGY MADRAS

BUSINESS DATA MANAGEMENT CAPSTONE PROJECT

MID TERM REPORT

Analysis of Food Management System in Railway Running Room

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Executive Summary:

One of the most important means of transport in India is Railways. Indian Railways contribute a lot to the Nation's economy.For the smooth functioning of Railways, Some big Railway Stations have Running Rooms beside, which are the rest areas for the crew of Railway. Crew includes ALP(Assistant Loco Pilot),LP(Loco Pilot),Goods Guard etc.

Running Rooms require high level attention in order to ensure the crew rest in proper and convenient way.All the required and necessary facilities should be made available for the well being of Railway Staff.A Running Room is associated with crew Lobby where all the information regarding Trains running is provided to the crew.A member of crew is forbidden to use Running Room in Home Station. There are hundred's of Running Rooms in India,which will be working on tender basis to serve the Railway Crew.South Central Railway has 6 divisions and under each of them there are some finite Running Rooms.There will be inspection in Running Room by CLI(Chief Loco Inspector),DRM(Divisional Railway Manager),ADRM(Additional Divisional Railway Manager),GM(General Manager),AGM(Additional General Manager) to ensure the best performance of Running Rooms.

After the report of Inspection,Supervisors along with Contractors make sure of rectifying the mistakes if any.There will be Foreman for every Running Room with 1-2 Supervisors, Kitchen Staff ,around 10 call boys etc.

The aim of the Project is to get an idea of how the Food Management System is overseeing in Running Rooms . As it's most important for the safety of Railway Crew,initial target is to address various problems and concerns faced upon maintenance of Running Room

Proof Of Originality:

RAILWAY RUNNING ROOM KAZIPET

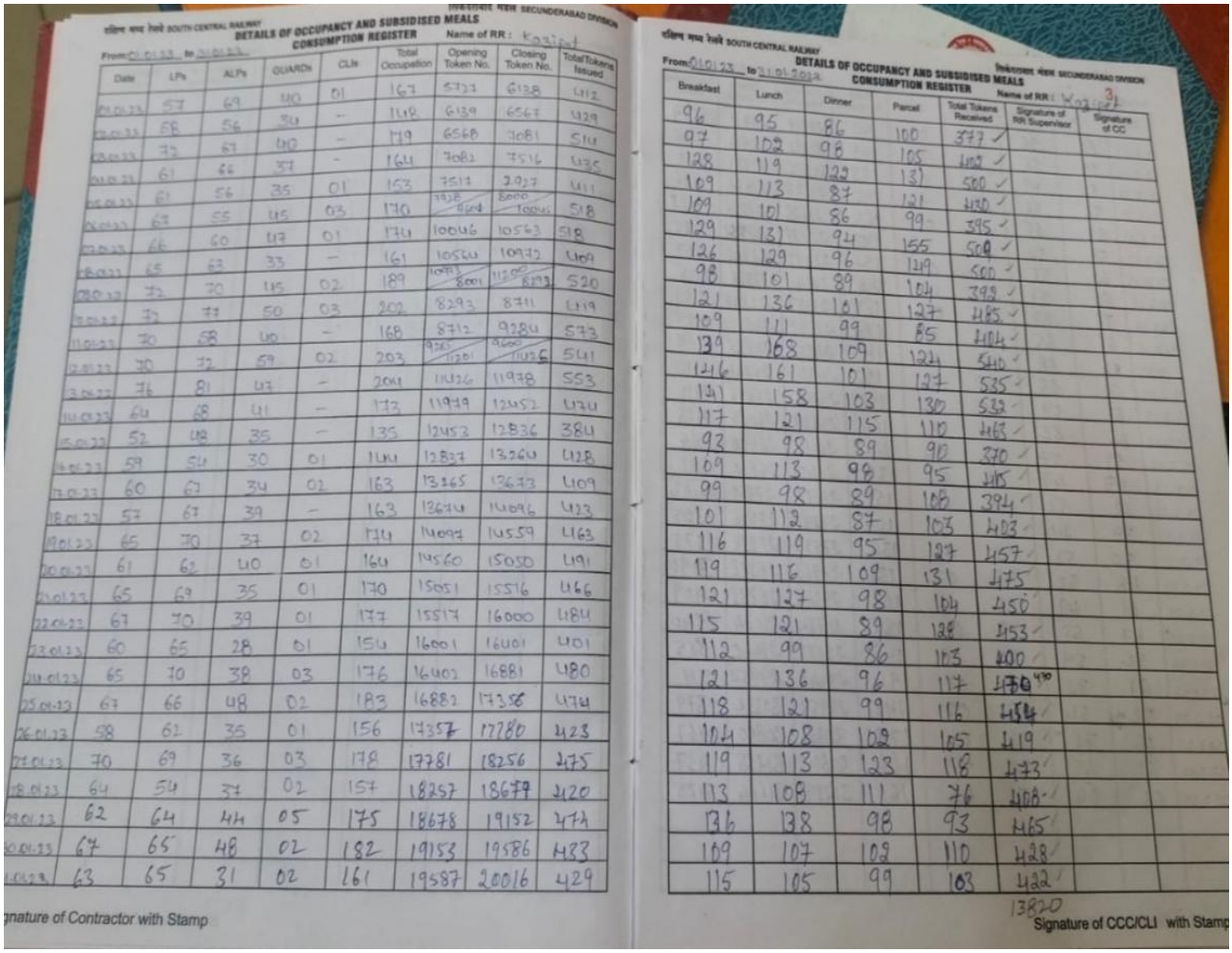
LETTER OF AUTHENTICITY

This is to certify that, I Mr.Kishan working as Supervisor in Kazipet Railway Running Room under MEGA Constructions has provided few months of the Menu Data of Railway Crew to Miss.UshaSri Gudikandula for the purpose of Project Work from IIT Madras.

The data provided by me to true to my knowledge and it can be used only to academic purpose.

G. Kishan

Signature of SuperVisor



DETAILS OF OCCUPANCY AND SUBSIDISED MEALS CONSUMPTION REGISTER

Name of RR : Kazipet

Date	LPs	ALPs	GUARDs	CLIs	Total Occupation	Opening Token No.	Closing Token No.	Total Tokens Issued
01.01.23	57	69	40	01	167	5722	6138	416
02.01.23	58	56	34	-	148	6139	6567	429
03.01.23	72	67	40	-	179	6568	7081	514
04.01.23	61	66	37	-	164	7082	7516	435
05.01.23	61	56	35	01	153	7517	2027	511
06.01.23	61	56	45	03	170	7938 / 8564	8000 / 8600	518
07.01.23	67	55	47	01	174	10046	10563	518
08.01.23	66	60	33	-	161	10526	10972	446
09.01.23	65	63	45	02	189	10983 / 8001	11500 / 8173	520
10.01.23	72	70	50	03	202	8293	8711	419
11.01.23	72	77	50	-	168	8712	9284	573
12.01.23	70	68	40	-	203	9285 / 1201	9800 / 1726	541
13.01.23	70	72	59	02	201	11026	11978	553
14.01.23	76	81	47	-	173	11979	12452	474
15.01.23	64	68	41	-	135	12453	12836	384
16.01.23	52	48	35	-	144	12837	13260	423
17.01.23	59	54	30	01	163	13265	13673	409
18.01.23	60	67	34	02	163	13674	14096	423
19.01.23	57	67	39	-	174	14097	14559	463
20.01.23	65	70	37	02	164	14560	15050	491
21.01.23	61	62	40	01	170	15051	15516	466
22.01.23	65	69	35	01	177	15517	16000	484
23.01.23	67	70	39	01	156	16001	16401	401
24.01.23	60	65	28	01	176	16403	16881	480
25.01.23	65	70	38	03	183	16882	17356	474
26.01.23	67	66	48	02	156	17357	17780	423
27.01.23	58	62	35	01	178	17781	18256	475
28.01.23	70	69	36	03	157	18257	18677	420
29.01.23	64	56	37	02	175	18678	19152	474
30.01.23	62	64	44	05	182	19153	19586	433
31.01.23	67	65	48	02	161	19587	20016	429
01.02.23	63	65	31	02				

Signature of Contractor with Stamp

DETAILS OF OCCUPANCY AND SUBSIDISED MEALS CONSUMPTION REGISTER

From 01.01.23 to 31.01.2023

Name of RR : Kazipet

Breakfast	Lunch	Dinner	Parcel	Total Tokens Received	Signature of RR Supervisor	Signature of CC
96	95	86	100	377		
97	102	98	105	402		
128	119	122	131	500		
109	113	87	121	430		
109	101	86	99	395		
129	131	94	155	509		
126	129	96	129	500		
98	101	89	104	392		
121	136	101	127	485		
109	111	99	85	404		
139	168	109	124	540		
1216	161	101	127	535		
121	158	103	130	532		
117	121	115	110	463		
93	98	89	90	370		
109	113	98	95	415		
99	98	89	108	394		
101	112	87	103	403		
116	119	95	127	457		
119	116	109	131	475		
121	127	98	104	450		
115	121	89	128	453		
112	99	86	103	400		
121	136	96	117	470		
118	121	99	116	454		
104	108	102	105	419		
119	113	123	118	473		
113	108	111	76	408		
136	138	98	93	465		
109	107	102	110	428		
115	105	99	103	422		

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Signature of CCC/CLI with Stamp

Meta Data and Descriptive Statistics:

Meta Data:

Data used for this analysis was provided by the Running Room Kazipet which is located in Warangal, Telangana.This meta data describes a food management system which is designed particularly for railway running rooms.The system targets to efficiently manage food inventory,meal planning and parcel of meals to the railway crew.All the Running Rooms in India in Tender based manner.Now Kazipet Running room is under the supervision of Mega Constructions.

Generally,In Running Room Kazipet ,Menu will be fixed for a day in a week.As it is the contract based system, there will be no delay in providing the ingredients to the Running Room.Coming to stock of the products, all the ingredients that are required for the different menu items for a 15 days are kept in stock.

All the ingredients are used according to the FIFO(First in First Out)to ensure that the ingredients that are being used have the optimum freshness and prioritize food safety. But the vegetables and milk , water etc will be supplied every day early morning.Meals will be supplied 3 times in a period of 24 hours. Break Fast,Lunch and Dinner.One-packed meal should be provided to each crew while leaving in order to have it during the duty hours .All the meals that are being provided are subsidized meals as it is the not profitable service.

All the data that is collected is in form of paper work.Everything is manually entered to the excel sheet and further calculations are done.The Data collected is of 3 months i.e., February,March and April.The data is shared by the supervisor of Running Room.The Data which was collected consists the information regarding the food that is being served to the railway crew.

It consists of:

- Total number of ALP,LP,GUARD,CLI coming to running room each day.
- Quantity of each menu item that is being served in a day.
- Quantity of items wasted each day due to various reasons(Over Production, Spoilage,Crew Plate Waste)
- All Items that are being served each day.
- Amount of some of significant ingredients that are used in different menu each day

So Using all the information that is being provided , It is possible to Calculate the mean of different type of meals and I can suggest the amount to be cooked per a day in order to reduce the wastage of food. With the help of amount of food being being wasted, Ingredients wastage can be calculated and can be reduced with some data driven solutions.

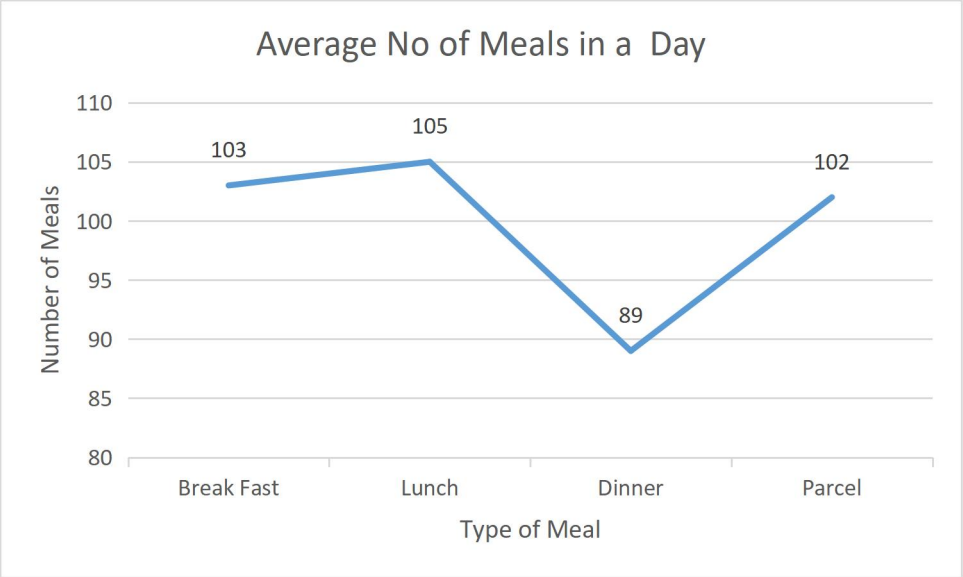
Descriptive Statistics:

S.No	ITEM	QUANTITY PER DAY	WASTAGE PER DAY
1	RICE	40KGS	4-5KGS
2	IDLI	8KGS	1-2KGS
3	SAMBAR	15Lts	3-4Lts
4	TEA	15Lts	2-3Lts
5	TOTAL VEGETABLES	80KGS	5-6Kgs
6	DAL	6KGS	.5-1 Kg
7	CHAPATI/PURI	20Kgs	.5-1Kg

Table1

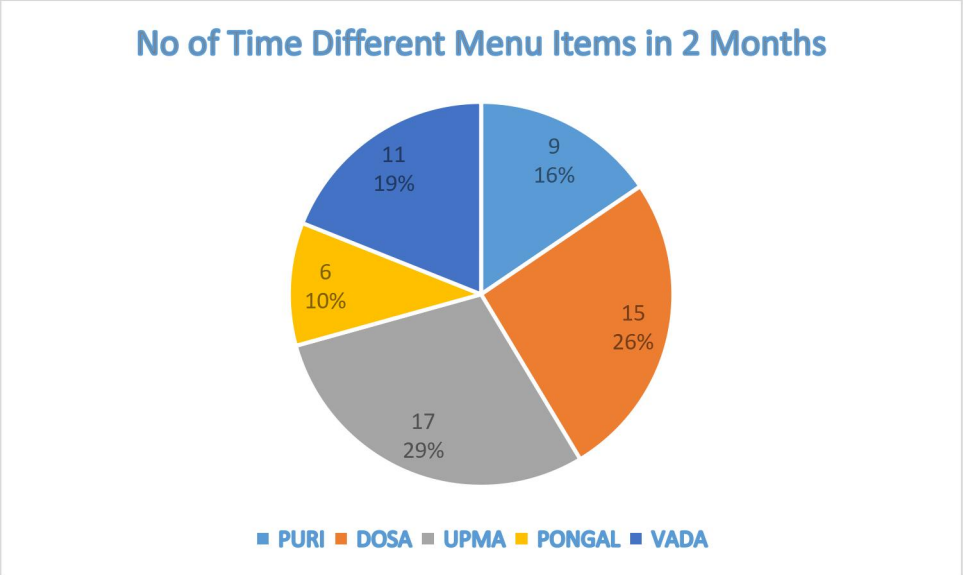
Table 1 shows us some of the regular and mandatory items in order to serve the Meals. And Every items has individual wastage data.In order to suggest an efficient way to reduce these wastage clear analysis should be done.Different items will be wasted based on the other items that are being served on the day, due to over production or it may be due to crew plate waste or even spoilage due to weather.

Consider the Graph1.It visualizes the average number of meals in day of each type that is Break Fast Dinner Lunch and Parcel.If we look into the graph we can see that the average no of meals in dinner is less compared to lunch breakfast and parcel.This is because most of trains run during the day time and less crew will be in their duty hours during night. Hence the reason for less average of dinner. Average of parcel is almost that of lunch and break fast It is because most of the crew take these parcel as snacks and many crew wish to have chapati in their parcel.



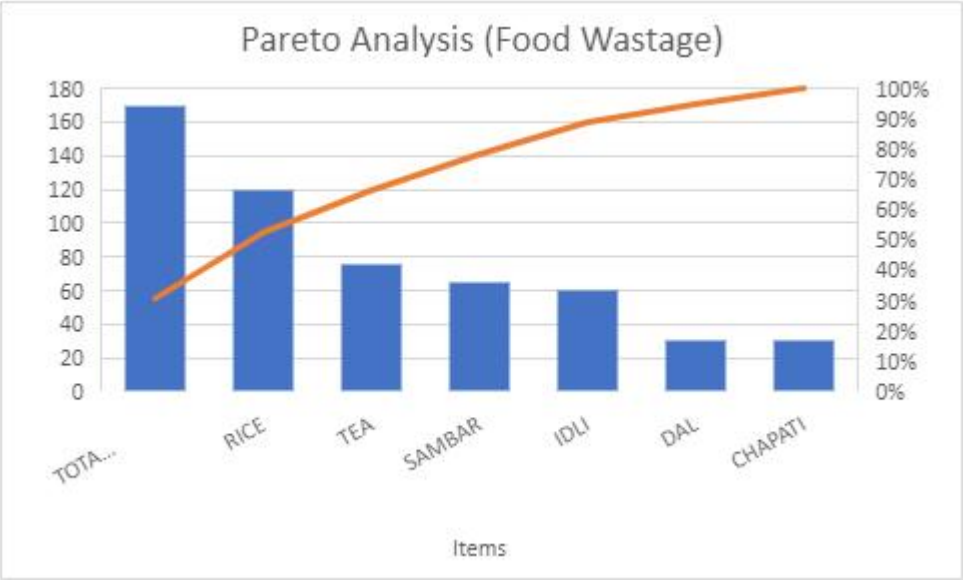
Graph1

Graph2 gives us the distribution of different menu items that are being served as breakfast in 2 months February and March.As we can see Vada and Dasa has more percentage and the pongal has the least distribution.Since Dosa has 26% percent of the 2 month distribution the wastage of IDLI is also more.



Graph2

In Running Room , Approximately 4000-5000 meals be provided every month. Average number of meals for the month Feb, March and April is 4800 approx.



Graph3

From the Pareto Analysis we can say that the first four items contribute to 80% of wastage of the total wastage in the running room.Hence there should be limitation in cooking these items in order to reduce the wastage.

Detailed Explanation of Analysis Process:

For the purpose of analyzing the data,we will be using Microsoft Excel and different features like PIVOT Table,GRAPHS,Mathematical Formulas of it are also used.In depth analysis should be done in order to summarize the things.Using Various tools upon various information provided in data gives us different dimensions and insights to draw the conclusions from the data.

After entering all the provided information into the excel sheet ,some of the missing values have been removed and the data is made clean and further procedure has been done.

Stacked Bar Chart is an effective tool in data Analysis.It has been used to analyse the wastage of one of the regularly served menu ITEM(IDLI) with other menu items.

Pie Charts can help us show the data as a percentage of a whole.Therefore pie chart is used to know the distribution of various menu items served across a month or a period of time.pie char is also used in the Visualization of Wastage of Food for different Reasons.

Whisker and box plots are used to visualize the five number summary of the data. The five number Summary is MINIMUM,Q1,MEDIAN,Q3,MAXIMUM. Using these 5 values it will convenient and easy to compare these aspects with other entities and draw conclusions.It is used in visualizing the Total number of Crew to the Running Room in 3 different Months (February,March and April).The Supervisor should the median visit of crew to the Running Room and plan meals accordingly.

Line Chart gives us the trends in the data.It is used to plot and visualize the average type of meal per a day.Based on the trend the items for the lowest value can be made in lesser quantities.

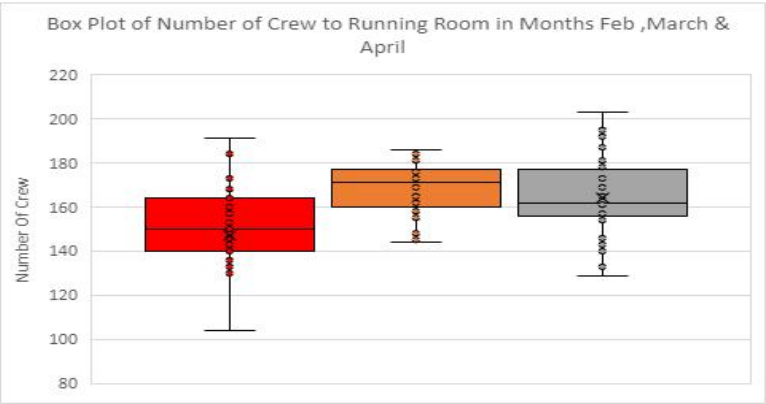
SUM,AVERAGE,QUARTILE.INC ,ROUNDUP are some of the tools that are used to for visualizing various graphs.

Pareto Analysis can be done to know the prioritized menu .In this case Pareto Analysis can be used to know that menu which is being wasted in less quantity and that item can be made available more in order to reduce the wastage.

Pivot Table has the great advantages over all the tools.It has been used to sum up many columns in the data and the values like MIN,MAX are found for the purpose of box plot.

Results & Findings:

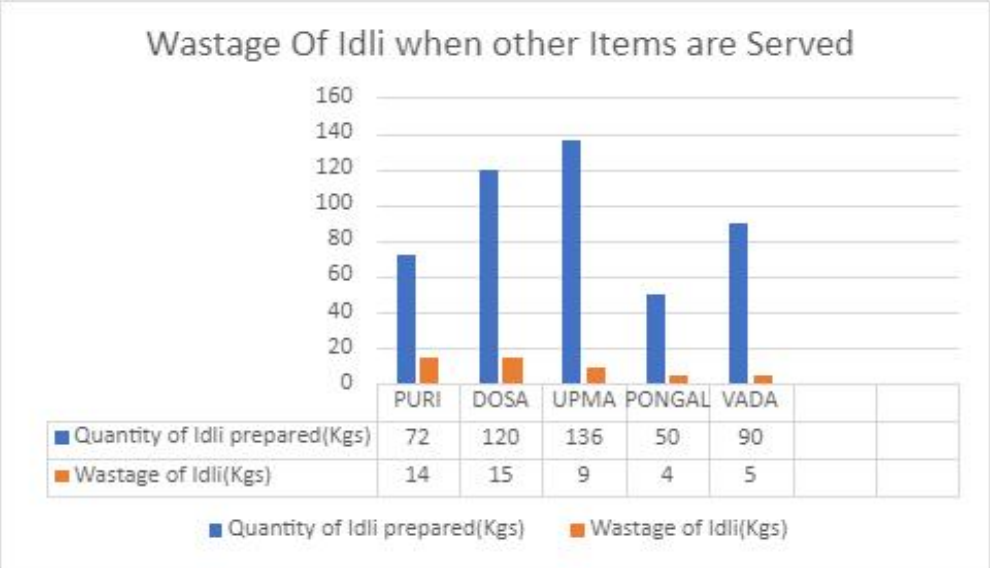
1.Month wise Count Of Railway Crew in form of Box Plot (February, March and April)



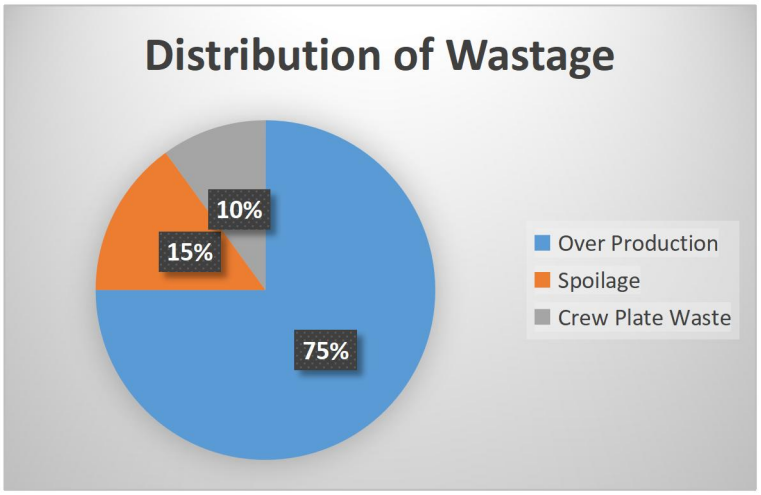
We can see that from the graph,The medians of 3 box plots are not overlapping that is the data is variant among these 3 months.There is no proper correlation between the number of crew to the running room which eventually leading to lot of difficulty in managing the food to be cooked each day.Hence different months have different IQR , average and RANGE.Even the minimum number and the maximum numbers also have lot of variation.As this data is insufficient to draw a conclusion regarding the food wastage there are more factors to be considered.

2.Wastage Visualization of one of the menu Items

From the Data we can infer that IDLI is the regular and also highly wasted ingredient.So the wastage of it depends upon the other menu items served on the day.From the graph below we can infer that when the other items are puri and dosa ,Idli is being highly wasted.So the quantity of Idli should be less when these Items are served. As items like PURI , DOSA are highly preferable for the breakfast than IDLI and also as IDLI is the regular menu item for breakfast it is not the most chosen one.PONGAL is the menu item which will be cooked because as it was in the menu.Its not the most preferable one hence we can see less wastage of IDLI during PONGAL was cooked.By this way one of major wastage can be reduced.



3.Distribution of Wastage of Food



Considering the above graph, We can know that the major reason for wastage of food is the Over Production. As there is lot of inconsistency regarding the crew count,there is huge imbalance in amount of food that is being cooked.Over Production of food leads to spoilage of food.Crew Plate waste is also a reason for the wastage.This is happening because of the native places of the Crew.They will not be satisfied with the taste they are being provided with and hence the wastage.

These are some of the results and Findings regarding the wastage of Food.