Quantifying The Impact of Food Waste Reduction In Your P&L

A guide for operators to isolate cost savings and margin impact with Winnow's Food Waste food waste P&L Methodology

Forward

With food prices at their highest level in over 60 years, there's never been a more important time to tackle food waste.

The benefits of reducing food waste are well documented, however isolating the positive impact in a restaurant's P&L has always been challenging.

Winnow has developed a Food Waste P&L Methodology to help operators and finance analysts solve this problem. Adjusting for inflation, mix, and purchasing volumes helps you isolate the impact that food waste reduction has, giving enterprises real-life proof points to scale up technology which drive both significant cost savings and environmental impact.

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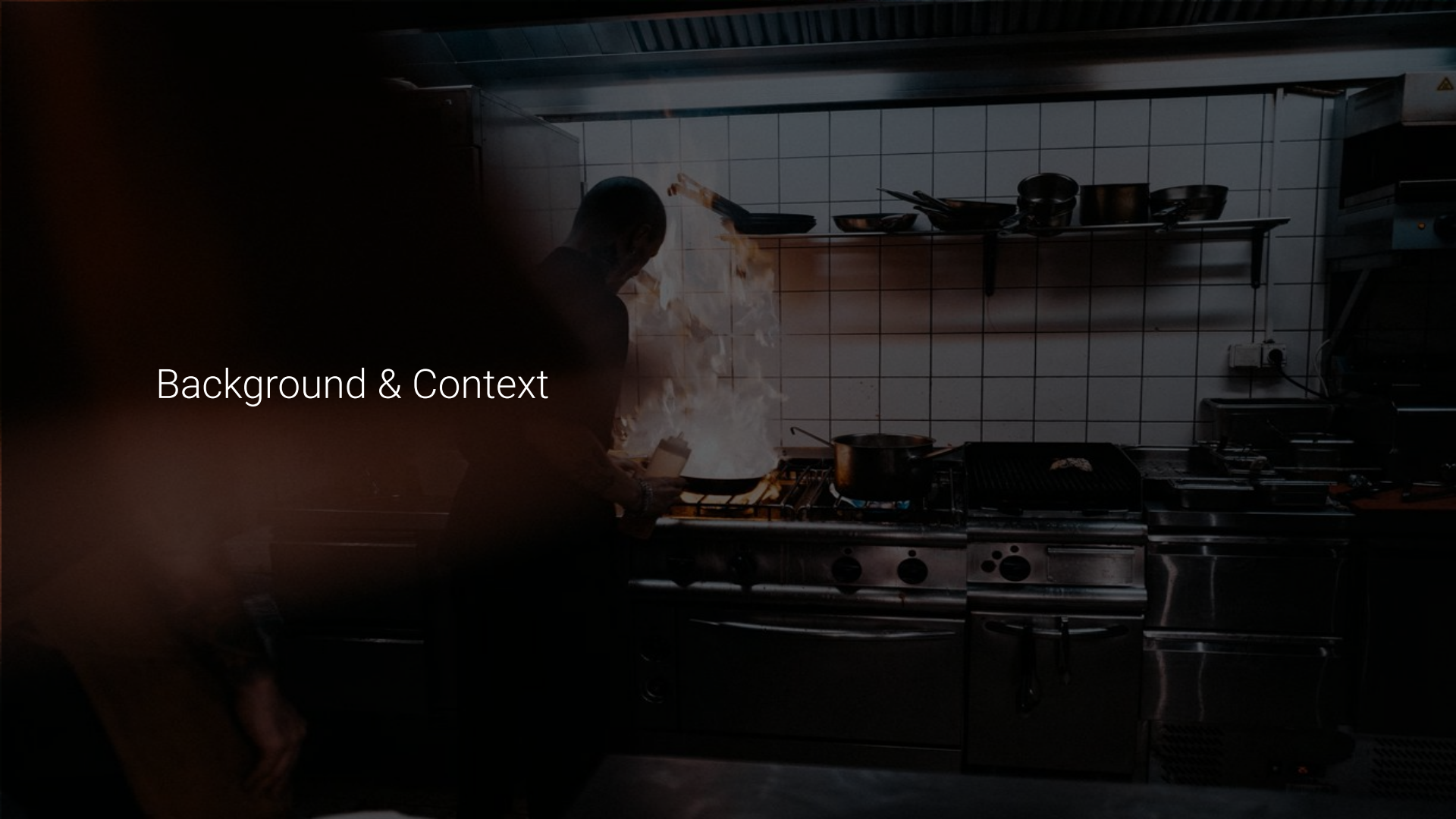


Background & Context

Food Waste and the Kitchen P&L

Your kitchen's profit and loss (P&L) statement measures its financial performance over a specified period of time, by reflecting its sales and costs. Whilst it is relatively straightforward to accurately account for key components like sales, cost of goods sold (COGS) and labour costs, isolating the impact of food waste in the P&L has historically been a challenge for all hospitality businesses.

Food waste is rarely itemised within a kitchen P&L, as the cost is already accounted for in the COGS. This is in large part because food waste in itself is hard to measure accurately and consistently. Manual methods of measurement are often inaccurate, which is why Winnow helps teams to automate this task with technology.

Waste will effectively be masked within a kitchen's food cost %, with more wasteful kitchens much more likely to exhibit reduced levels of profitability. Uncertainty over demand is a challenge for many operators.

As kitchens reopen, teams struggle to forecast daily consumer demand and changes in consumption patterns. Businesses with more developed food waste reduction strategies may employ various methods to measure the impact of food waste reduction on the P&L.

For example, operators may choose to compare sites with reduction measures in place vs. those without, which helps to isolate changes in food prices or seasonal fluctuations in customer volumes. Others may ask teams to make budget adjustments based on measured food waste reductions. Whilst helpful, ultimately these methods fail to create an in-depth view of the true impact that food waste reduction really has on a specific site or kitchen.

Winnow's technology accurately records both the weight and cost of food wasted for our users. **Combining a food purchasing cost file and accurate weight measurement via our digital scales, our users can get granular data on the true cost of each wasted item which can be fed back into the kitchen's P&L.** Users also benefit from food waste images which show a before and after picture of waste levels giving greater insight and confidence in the efficacy of the program.

Why We've Created This Methodology

The reality is that analysts will still want to isolate food waste in their own P&L.

It's for this reason that Winnow has developed a step-by-step method for any kitchen to perform an analysis that isolates the impact of a food waste reduction program.

The method is based on an established accounting practice called Sales Variance Analysis. A sales variance is the monetary difference between actual and budgeted sales.

It is used to analyse changes in sales levels over time and may be employed by a business wanting to understand the impact of pricing, mix and sales volumes, vs. budget forecasts.

Using a similar approach, Winnow's method seeks to disaggregate the main components of a kitchen's variance in food cost: food price inflation, changes in mix, changes in volume, and finally food waste itself.

Using this approach to compare periods pre-intervention and post-intervention can isolate the P&L impact of a food waste reduction program.

Let’s Define Some Terms That We’ll Be Using In Our Methodology

Food price inflation

The change in food prices for specific food items over a set period of time.

Food waste reduction

The reduction in food waste by value for a specific period vs baseline.

Food waste cost

The monetary value of food waste for a specific period measured by Winnow.

Mix

The proportion of food purchased for specific products (e.g. peppers, chicken, tortillas) compared to total food purchases over a specific period of time.

Food waste baseline period

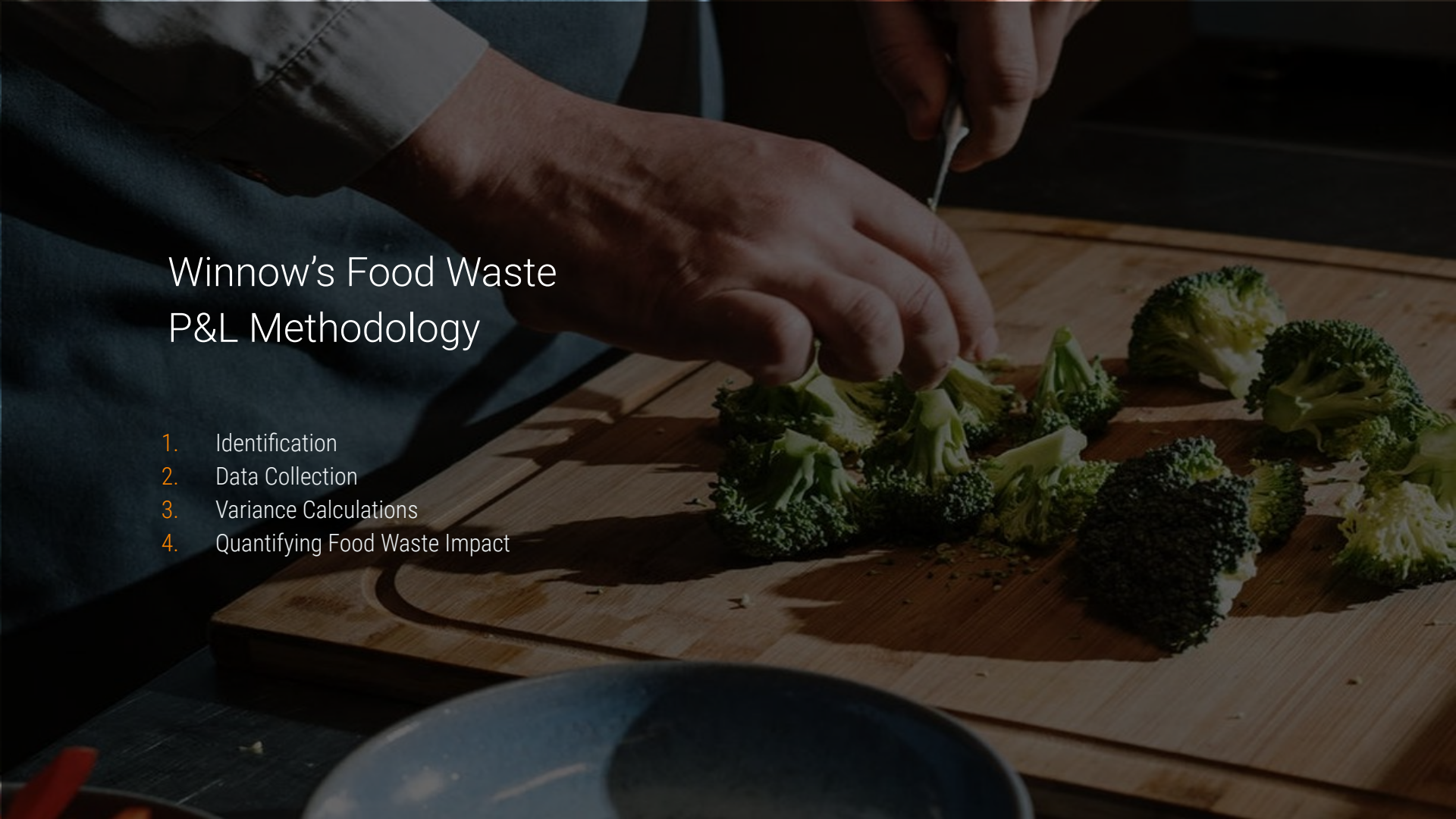
Financial value of food wasted pre-intervention in a specific location over a specified period.In our example this is Month 1.

Analysis period

The current period post-intervention that is to be compared with the food waste baseline period. In our example this is Month 6.

Volume

A measure of the volume of custom (e.g. number of covers, number of customers, number of hotel guests) for a specific period of time.



Winnow's Food Waste P&L Methodology

1. Identification
2. Data Collection
3. Variance Calculations
4. Quantifying Food Waste Impact

1.

Identification

The first stage is straightforward - you need to define the scope of work and the period by which you are going to do the analysis. This breaks into a few components:

Baseline Period

The period before you've made any waste reductions. Typically this is the period prior to the start of food waste reduction in the kitchen with Winnow.

Comparison Period

The latest period where you want to see the impact of the initiatives you've made. Usually this is the most recent couple of months. However, you'll also want to make sure that the business period you are comparing is reasonably similar to the baseline period. Be mindful of any significant shifts in business (e.g. large changes in event catering as a share of total business, turnover of senior kitchen staff)

Scope of analysis

Generally this is the kitchen where you have been measuring waste. This is often pretty straightforward but in large operations like resorts, you'll want to - as best you can - isolate a P&L for the area of the operation where you are measuring and addressing waste. The best case is that you are addressing waste across the entire operation.

2.

Data Collection

Once you have defined your baseline and analysis periods you need to collect and organise your data inputs. For each period you will need to collect:

Food Purchasing Costs

You'll need these itemised by product and in a comparable format.

E.g. If some items are priced by weight and others are priced by packet/box etc. you'll need to make some assumptions to convert all line items to weight and cost which can then be compared to analyse mix.

Customer Volume

You'll need to compare the volume of customers for each period. Use an existing metric which is easily accessible from your point of sale, property management system or similar.

E.g. Number of covers, stays, number of guests etc).

Your Food Waste Data

Food waste cost per period with a forecast figure for food waste reduction.

A simplified example of what your data tables might look like | Baseline **Month 1**

	Quantity purchased (kg)	Food purchasing (£)	Cost/kg (£)
Peppers	200	800	4
Chicken	100	600	6
Tortillas	25	125	5
Beans	100	100	1
Rice	50	75	1.5
Total	475	1,700	3.58

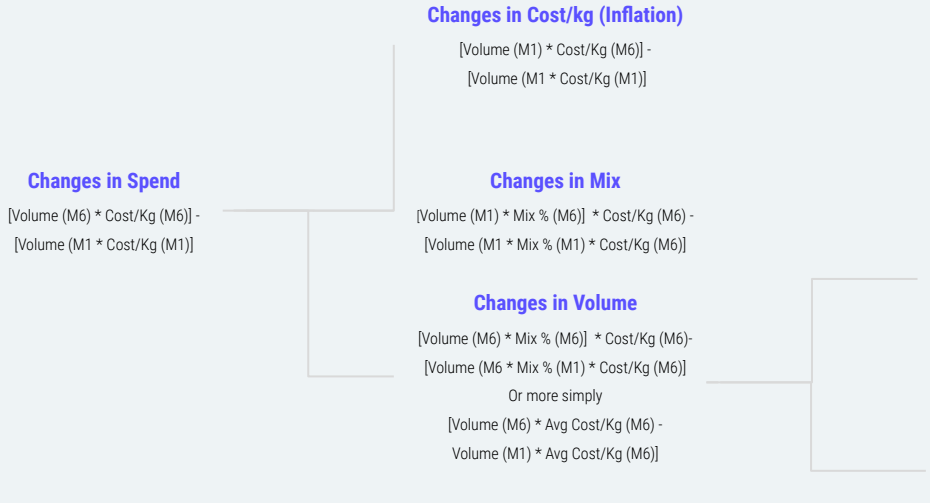
Number of customers	600
Consumption per guest	792g
Total food purchased per customer	£2.83

3.

Decomposition Calculations

Once you've collected and organised your data inputs you can calculate the impact of inflation, mix and customer volumes to calculate the variance in total food purchased per customer. If the kitchen has been successful in reducing food waste, we'll see a reduction in food purchased per customer in volume per guest. The diagram below gives an overview of how these elements are split out from each other based on the data we've collected.

An overview of the calculations we will walk through in this guide



Note: M1 = month 1; M6 = month 6

3.

Decomposition Calculations

We'll use our simplified example of a kitchen which only purchases peppers, chicken, tortillas, beans and rice as presented in a previous slide.

On the right is their data table for the comparison period (Month 6).

Overall you can see there has been an increase in food spend of £275 (£1,975 (Month 6) less £1,700 (Month 1)).

Comparison period | **Month 6**

	Quantity Purchased (kg)	Food purchasing (£)	Cost/kg (£/kg)
Peppers	150	675	4.5
Chicken	140	980	7
Tortillas	30	150	5
Beans	95	95	1
Rice	50	75	1.5
Total	465	1,975	4.25

3.1

Variation Due To Food Price (Inflation)

In this example we can see that food prices have increased in the comparison period for peppers and chicken.

We quantify the impact of food price inflation by calculating what we would have paid for our items in Month 1 but at Month 6 prices.

Taking Peppers as an example

In Month 1 we bought 200 kg of peppers at £4/kg totalling £800 (£200*4). Purchasing the same volume at the inflated Month 6 price of £4.50/kg increases the cost of peppers to £900 (£200*4.5). Taking the difference of these is £100 (£900-£800), which is the isolated inflation impact of peppers.

Inflation impact

	Month 1 Quantity Purchased (kg)	Month 1 Cost £/kg	Month 6 Cost £/kg	Month 1 volumes at Month 1 prices Total food purchased (£)	Month 1 volumes at Month 6 prices Total food purchased (£)	Variance (£)
Peppers	200	4	4.5	800	900	100
Chicken	100	6	7	600	700	100
Tortillas	25	5	5	125	125	0
Beans	100	1	1	100	100	0
Rice	50	1.5	1.5	75	75	0
Total				1,700	1,900	200

Doing the same for Chicken gives a inflation variance of £100, and there is no inflation variance for the other ingredients as there is no change in their price.

The total inflation impact is £200.

3.2

Variation Due to Food Mix

In this example we can see that the mix changes in Month 6 as the kitchen buys more chicken which is a higher cost item.

To calculate the exact change in food cost as a result of mix, we need to first calculate the Month 6 mix percentage for each food item, as shown in column **[A]** (e.g. Peppers 150/465 = 32%).

We can then calculate the hypothetical Month 1 quantity of food purchased at Month 6 'mix', shown in column **[B]** (e.g Peppers 32% x 475kg = 153kg).

We can then calculate the hypothetical cost of each item at the Month 1 quantity at Month 6 mix, shown in column **[C]** (e.g. Peppers: 153kg x £4.5/kg = £690).

We can then compare that to the Month 1 quantity at Month 6 prices **[D]** (taken from our Variance due to food price analysis) to give us our **variance** as a result of mix **[E]**, which **in this example is £117**.

	Month 6	Month 6 Mix	Month 1	Month 1 quantity at Month 6 Mix	Month 6	Month 6 mix & cost at Month 1 Quantity	Month 1 Quantity at Month 6 Price	
		[A]		[B]		[C]	[D]	[E]
	Quantity Purchased (Kg)	Percentage (%)	Quantity Purchased (Kg)	Quantity (Kg)	Price (£/Kg)	Cost (£)	Price (£)	Variance (£)
Peppers	150	32%	200	153	4.5	690	900	-210
Chicken	140	30%	100	143	7	1,001	700	301
Tortillas	30	6%	25	31	5	153	125	28
Beans	95	20%	100	97	1	97	100	-3
Rice	50	11%	50	51	1.5	77	75	2
Total	465		475	475		2,017	1,900	117

It's worth noting here that whilst Variance of £117 due to change in mix is interesting in its own right, what is perhaps more helpful is to also understand the changes that drove this variance.

Fewer peppers and more chicken, in this example, could be driven by consumers having an increased preference for a certain menu item or by changes in recipes which allocated different amounts of key ingredients to a single dish or offer.

We see these types of shifts quite regularly in buffets where what is served can change over a month depending on customer preference, menu changes, or even just the amount of budget a chef has left to spend for the month.

3.3

Variation Due to Volume of Customers

We need to account for the change in volume of customers between the baseline and current period.

This is calculated by first working out the Month 1 average consumption per guest:

Total Volume Purchased / Number of guests, as shown in **column [A]**. On a totals basis this is calculated at 0.792 kg/guest (475kg/600 guests).

We then need to calculate the weighted average cost per kilogram for Month 6, which is the total spend in Month 6 divided by the total volume in Month 6, shown in **column [C]**. On a totals basis this is calculated at £4.247/kg (£1,975/465 kg).

We then need to quantify the variance by multiplying the change in the number of guests (720-600 = 120 guests) by the Month 1 average volume per guest (0.792kg/guest) and the Month 6 weighted average cost per kilogram.(£4.247/kg).

This gives a variance of £403.
*(120*0.792kg/guest*£4.247/kg)*

Change in Number of Guests impact

	Month 1			Month 6					
	Quantity Purchased (kg)	Number of guests	[A] Avg volume of food per guest (kg/guest)	Number of guests	Quantity Purchased (kg)	[B] Avg volume of food/ guest (kg/guest)	Food purchasing (£)	[C] Weighted Average Cost/kg (£/kg)	Variance (£)
Peppers	200	600	0.333	720	150	0.208	675	1.452	138
Chicken	100	600	0.167	720	140	0.194	980	2.108	200
Tortillas	25	600	0.042	720	30	0.042	150	0.323	31
Beans	100	600	0.167	720	95	0.132	95	0.204	19
Rice	50	600	0.083	720	50	0.069	75	0.161	15
Total	475	600	0.792	720	465	0.646	1,975	4.247	403

4.

Quantifying Food Waste Impact

Finally there is the variance as a result of change in buying more or less food per guest, which is what quantifies the impact of food waste reduction. This is calculated by first working out the Month 6 average consumption per guest:

Total Volume Purchased / Number of guests, as shown in **column [B]**. On a totals basis this is calculated at 0.646 kg/guest (465 kg/720 guests).

We can then calculate the variance as a result of change in buying more or less food per guest by multiplying the change in consumption per guest (0.646 kg/guest - 0.792 kg/guest) by the number of customers in Month 6 (720 guests) and the weighted average price per kilogram in Month 6 (£4.247/kg).

This gives a variance of -£446
([0.646 kg/guest - 0.792 kg/guest] *720 guests*£4.247/kg)

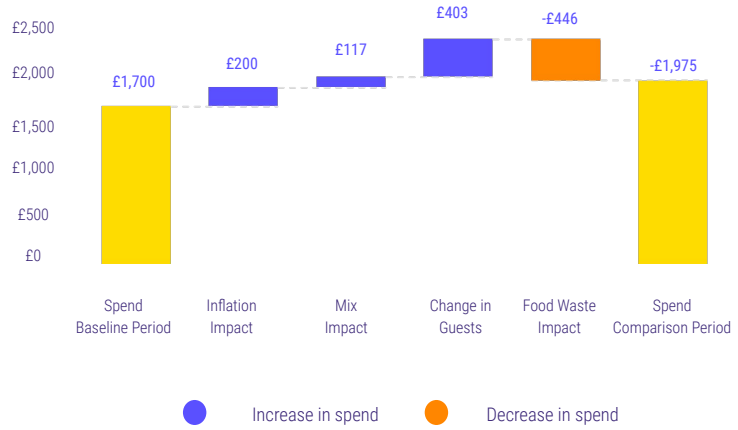
Quantifying Food Waste Impact

	Month 1			Month 6					
	Quantity Purchased (kg)	Number of guests	[A] Avg volume of food per guest (kg/guest)	Number of guests	Quantity Purchased (kg)	[B] Avg volume of food/ guest (kg/guest)	Food purchasing (£)	[C] Weighted Average Cost/kg (£/kg)	Variance (£)
Peppers	200	600	0.333	720	150	0.208	675	1.452	-152
Chicken	100	600	0.167	720	140	0.194	980	2.108	-221
Tortillas	25	600	0.042	720	30	0.042	150	0.323	-34
Beans	100	600	0.167	720	95	0.132	95	0.204	-21
Rice	50	600	0.083	720	50	0.069	75	0.161	-17
Total	475	600	0.792	720	465	0.646	1,975	4.247	-446

Summary

To summarise the total variance in food spend can be categorised as follows, which highlights a £446 saving as a result of food waste reduction.

While this gives you a picture of the key drivers of your changes in food costs, we should also keep in mind that it assumes that customers are consuming a similar amount of food over the same period.



Other Factors Can Impact These Numbers Which Should be Considered

Changes in inventory levels (over the long run, this is less of a factor but ideally you should net these out)

Over/under portioning by staff

Changes in appetite by guests of free-issue food

Most notably, the last two are hard to measure and could also materially impact the Purchases-per-Guest metric.

To minimise this risk, we suggest picking comparison periods where there is a similar profile of customer. Choosing comparison periods which aren't too far from each other in time also help to ensure you have consistent staff behaviour.

Finally, measuring plate waste can be a good way to track changes in portion quantities provided by staff.

If your pre-consumer waste goes down but plate waste goes up, it's likely because your teams have in fact started over-portioning plates which can be corrected through re-training portion guidelines.

Choosing What to do with Savings

Businesses then have a choice in whether they choose to “bank” savings to boost margins, or whether they reinvest in better quality ingredients to improve customer satisfaction. But which is right for your business?

In sectors where cost control is critical such as contract catering, most businesses will want to see visible financial improvements arising from food waste reduction programs. Banking savings requires an adjustment in the kitchens’ monthly budget in line with identified reduction in food purchases per guest / customer as identified by the analysis. This needs to be handled proactively with senior chefs, and Winnow recommends that senior chefs and teams be given incentives to reduce waste and improve margins. In less cost conscious environments such as the luxury hotels, teams may choose to reinvest savings into better quality products.

Winnow has seen examples of teams creating ‘Wow’ moments for customers such as lavish seafood banquets which help improve customer satisfaction and drive repeat custom. With food price inflation showing no signs of slowing down, savings could also be reinvested in simply maintaining product quality while maintaining existing margins.

Implications & Conclusions

The business case for addressing food waste is clear and well documented at a macro level, with numerous studies from WRA, WRI, ReFed and others proving an overwhelmingly positive ROI.

We hope that by creating a consistent, repeatable methodology to disaggregate cost savings from inflation, changes in mix and volume, that we create more momentum across our industry to prioritise food waste reduction.

As food price inflation continues to put pressure on margins, and consumers and policy makers put increased emphasis on sustainability, there has never been a more important time to run a kitchen with ruthless efficiency.

Now armed with this tool, clients using Winnow are able to see these benefits in their own financials, and are increasingly placing food waste reduction as a strategic priority.

Our call to action for the rest of the sector is to use this tool in your own operations - we'd love to hear your thoughts and findings. Take a look at our template on food cost decomposition analysis for a greater understanding of our methodology.

About Winnow

Winnow was founded with a simple belief that food is too valuable to waste. Yet measuring food waste is a challenge for all commercial kitchens with up to 20% of all food purchased going to waste (typically 5%-15%).

Our mission is to connect the commercial kitchen, create a movement of chefs, and inspire others to see that food is too valuable to waste.

Winnow develops Artificial Intelligence (AI) tools to help chefs run more profitable and sustainable kitchens by cutting food waste in half.

From city centre hotels to casinos and cruise ships, Winnow offers a solution for every kitchen. Our analytics platform and reporting suite helps teams pinpoint waste quickly, allowing enterprises to drive significant waste reductions at scale.

Our hardware options range from simple digital measurement tools to our AI enabled Winnow Vision which 'learns to see' food being thrown in the bin. We understand that achieving and improving profitability in a professional kitchen can be a challenge. We will work with you every step of the way.

Get in touch to continue the conversation

info@winnowsolutions.com

Can Winnow Help You?

1. Interested in reducing food waste and cost?
2. Want to gain better understanding of food waste in your kitchens?
3. Are you spending ~100K$/year on food in each of your kitchens?
4. Do you prepare some or most of your food in advance?
5. Does your organisation have more than 10 sites with kitchens?

If you answered yes to all of these questions, speak to one of our food waste experts to find out what reducing food waste could mean for your business.

Get a Free Consultation