

FOOD WASTE AND RESCUE IN ISRAEL

The Economic, Social and Environmental Impact

Executive Summary

Introduction

The issue of food waste and rescue has been a recent topic of worldwide public discourse. There is now a broad consensus among experts and policy makers that food waste has a significant negative economic, environmental and societal impact, and that the most effective measures for reducing this impact is to optimize the prevention of food waste and the subsequent distribution of rescued food to the needy.

Acknowledging the importance of food rescue, the United Nations (UN) in September 2015 established a 50% food waste reduction goal by the year 2030. The US, one of the world's pioneers in food rescue, also established a similar national goal. Unfortunately, Israel is lagging behind most Western countries in awareness of the food waste problem and the importance of food rescue. The 2015 State Comptroller's Report on this issue states, among other things, that: "In Israel, food waste is an issue that has yet to receive government address. Also, no official data exists on food waste quantities in the supply chain."

Leket Israel, the country's national food bank, is a nonprofit organization (NPO) established in 2003 that works to rescue and redistribute surplus food nationwide to the underprivileged through a network of 180 partner NPOs. In 2015, Leket Israel rescued and redistributed approximately 15,000 tons of food with an estimated monetary value of 135 million NIS.

In view of the issue's importance, and lack of relevant data or policies to address it, Leket Israel has initiated an annual study and report on food

waste and rescue in Israel, prepared by the BDO Ziv Haft Consulting Group. The following report, based on the BDO economic model of the Israeli food sector, includes a comprehensive and detailed study of food waste in Israel. The report estimates the potential for food rescue in each of the value chain stages of food production, and points out the economic viability, and social and environmental benefits of food rescue in the country.

Leket Israel and BDO's inaugural food waste and rescue report reveals that there is 2.5 million tons of food wasted in Israel annually, constituting 35% of domestic food production. Roughly half of this waste is rescuable, meaning the food is worthy of human consumption. The value of this rescuable food wasted in Israel is estimated at 8 billion NIS annually. This report demonstrates the significant economic and social impact of food rescue to Israel's national economy. Rescuing 25% of food waste translates to a savings of 3 billion NIS, equivalent to the food purchasing gap between the food insecure and secure. Cost of such food rescue is 75% lower than the alternative of providing support, subsidies or allowances to the needy, and additionally offers significant environmental benefits.

We hope this report motivates Israel's decision makers to establish national goals for the reduction of food waste, as recommended by the UN, and consolidate a policy to eliminate obstacles currently delaying the realization and potential of food rescue in Israel.

Produced and presented by Leket Israel


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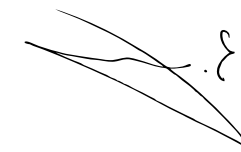
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Uniqueness of Food Production and Consumption

16% *of the average household consumption expenditure is allocated to food.*

Uniqueness of Food Production and Consumption

Food consumption accounts for about 16% of an average household's spending in Israel, and 22% of the consumption basket of households in the two lowest percentiles. Food is far more than a substantive component of the family consumption basket – it is a basic existential necessity, and the consumption of a nutritionally balanced diet is essential to ensuring population health in general and the well-being of infants and children in particular. Therefore, lack of food, or insufficient consumption of basic nutritional components, leads to potential health issues at a cost that is higher than the food production cost in each of the value chain stages.

Food constitutes a unique commodity, in terms of its manner of consumption and its production. The nutrients in food are derived primarily from agricultural produce: vegetables, fruit, legumes, dairy products, eggs, meat, fish, fats, etc. The cultivation, growth, and production of food rely on the utilization of natural resources such as land and water with substantive economic costs to these resources.

Israel is a densely populated country in which land is an expensive and limited resource (particularly in areas of high demand). Thus, use of land for surplus agricultural production that leads to food loss or waste incurs, beyond the direct economic costs, additional societal costs.

Furthermore, the cultivation, growth, and production

of food leads to significant environmental impact. Use of land, fertilizers and pesticides may damage water sources, wildlife, plants, and the environment. Currently, 20% of greenhouse gas emissions in the

Food waste occurs in all branches of modern industry and commerce, and in every aspect of consumption it is possible to reduce or recycle surplus production. However, the uniqueness of food, both in terms of production and consumption, necessitates particular address when considering food rescue and reuse.

world are generated during the various stages of growth, production, and distribution of food.

Food waste occurs in all branches of modern industry and commerce, and in every aspect of consumption it is possible to reduce or recycle surplus production. However, the uniqueness of food, both in terms of production and consumption, necessitates particular address when considering food rescue and reuse.

This report examines the issue of food waste and its rescue from an economic viability perspective, based on quantifiable estimates and assessments. Consequently, the report includes no additional ethical based considerations that may also be relevant to food rescue.





***Food rescue:
Combining economic,
environmental, and
social contributions***

33%

of all food produced in the world is lost

Food rescue is an exceptional policy measure that inherently incorporates both approaches. Rescuing food and transferring it to the underprivileged populace increases national productivity while concurrently reducing inequality

Food rescue: Combining economic, environmental, and social contributions

Food waste is not unique to the Israeli economy, and is evident in similar volumes in all Western economies. According to UN Food and Agriculture Organization (FAO) estimates, roughly a third of all food produced in the world is wasted, translating to a quarter of produced caloric value.

Food rescue is currently a central theme of global

discourse. Following food goals established by the UN, in September, 2015 the US government declared its own food reduction goal of 50% by the year 2030. Thus, the US has joined other countries that have also established national goals to reduce waste and rescue food.

The importance of rescuing food stems from three central benefits

1

Economic benefit

Rescuing food means transforming zero or negative value waste to an economically valuable commodity, thus increasing the national product and productivity.

2

Social benefit

Waste reduction reduces social gaps and prevents food insecurity in weaker underprivileged populations

3

Environmental benefit

Waste reduction reduces pollutant levels, greenhouse emissions, and use of finite land and water resources

The combination of these three food rescue characteristics creates a unique opportunity that requires the formation of an appropriate policy to reflect such benefits.

Food rescue is the economic endeavor of transforming food surplus, currently of zero or negative value, to food of economic value distributed to the underprivileged populace.

In terms of the Global Food Recovery Hierarchy, the first priority is the prevention of food waste, and use of this surplus food to feed the poor.

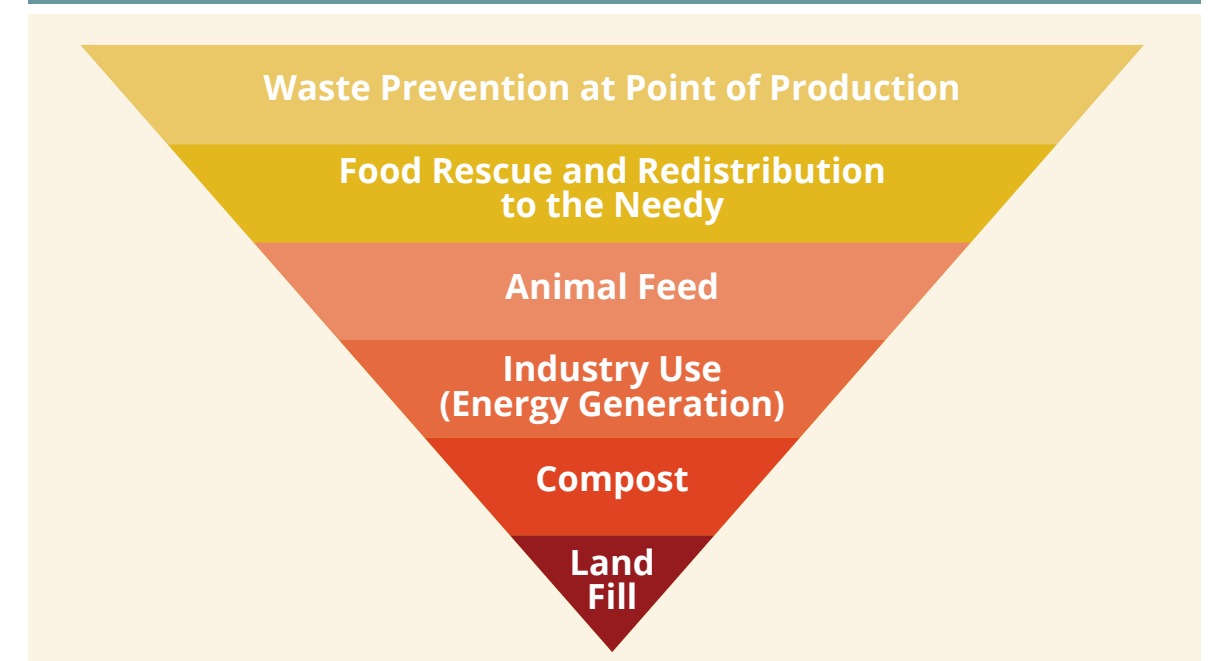
Many policy measures exist to address the need of the underprivileged, and deal with the problem of food insecurity. The most commonly used methods in Israel are support through donations, subsidies, allocations and allowances. The uniqueness of food rescue stems from its ability to help the needy at a low economic and budgetary cost. Instead of financing the full cost of food, it is possible to finance food rescue generally at a fifth of food prices.

There exists a constant disagreement in socioeconomic debate, both in Israel and abroad, between those proponents of encouraging growth ("Grow the Pie") as a primary objective to reducing poverty, and proponents of reducing inequality.

Food rescue is an exceptional policy measure that inherently incorporates both approaches. Rescuing food and transferring it to the underprivileged populace increases national productivity while concurrently reducing inequality.

Food rescue is the economic endeavor of transforming food surplus, currently of zero or negative value, to food of economic value distributed to the underprivileged populace

The Economic-Environmental Hierarchy of Food Recovery





***Food Rescue -
Alternative to
food production***

50%
of food loss in Israel is recoverable

Food rescue is a magic formula for producing food without substantive reliance on natural resources, land or water pollution, and use of fertilizers or pesticides.

Food Rescue - Alternative to food production

Throughout the growing, production, distribution and marketing of food in Israel, approximately 35% of domestically produced food is lost and becomes waste or surplus.

Economically speaking, food rescue should be viewed as a comprehensive alternative to excess food production.

Food rescue constitutes economic action to transform such surplus, with a zero or negative value, to food that is then distributed to the underprivileged populace. Economically speaking, food rescue should be viewed as a comprehensive alternative to excess food production. However, in contrast to the usual food production processes, the raw materials relied on for food rescue are surplus that would otherwise have been wasted.

Consequently, food rescue creates the availability of food without the utilization of resources and costs of production, while also preventing the majority of detrimental environmental impacts resulting through the production process. Food rescue is a magic formula for producing food without

substantive reliance on natural resources, land or water pollution, and use of fertilizers or pesticides.

Food Rescue Benefits		
	Food Production	Food Rescue
Product	 Nutritional Foods	 Nutritional Foods*
Nutritional Value	100%	100%
Land Use	Yes 	None 
Water Use	Yes 	None 
Greenhouse Gas Emissions During Production	Yes	None 
Use of Fertilizers and Pesticides	Yes	None 
Logistics, Distribution and Transportation Costs	Yes 	Yes 

*may be aesthetically flawed

Food rescue is not primarily philanthropic or charitable, but an alternative economic means for food production, one that is clearly beneficial to the national economy, and contributes to reducing inequality.

According to our estimates, approximately 50% of food waste is rescuable, equivalent to the production of 1.3 million tons of food, valued at 8 billion NIS. Currently, the majority of food rescue in Israel and abroad is carried out by NPOs, supported by donations. However, even if funding for food rescue is derived from donations, such activity is not primarily philanthropic or charitable, but an alternative economic means for food production, one that is clearly beneficial to the national economy, and contributes to reducing inequality. According to a study conducted in Australia, the multiplier reflecting the value of rescued food relative to rescue costs is 5.7. In other words, for every dollar spent rescuing food, 5.7 dollars' worth of food is rescued. There are additional environmental and societal benefits generated by food rescue as well. According to Leket Israel, the cost of rescue is 1.4 NIS for every 1.0 Kg of food. The value of the food is 5.1 NIS per 1.0Kg, resulting in a multiplier effect of 1:3.6. Therefore, each 1.0 NIS invested by NPOs

in food rescue provides 3.6 NIS worth of food for the needy clientele they serve. Although food rescue in Israel is still in its infancy, there seems to be enormous potential for expansion utilizing economies of scale to reduce the cost of food rescue, and/or raise the value of rescued products - a fact that would in time enable the increase of the multiplier similar to that seen in Australia. However, to be conservative in our estimations, we have based our assessments on the current cost structure. In terms of benefits to the national economy, it is also necessary to consider the positive environmental and societal contributions of food rescue. We did not assess such impact in the context of the Israeli economy, but assuming such environmental and societal benefits are similar to the average costs around the world, the multiplier would then increase to 7.2. As a result, a calculation that includes environmental influences would mean that every 1.0 NIS invested in food rescue generates 7.2 NIS to the national economy.

Food Rescue Feasibility Assessment Food Cost / Benefit NIS per kg						
	Recovered Food Value*	Environmental Social Contribution (FAO estimates)	Total National Economy Value	Rescue Cost	Rescue Value	Multiplier
To National Economy – Excluding External Factors	5.1	Excluded	5.1	1.4	3.7	3.6
To National Economy – Including External Factors	5.1	5	10.1	1.4	8.7	7.2



***Food Rescue –
Feasibility to the
national economy***

5 Billion NIS
food rescue has a 5 billion NIS potential profit to the national economy

Food rescue alleviates food insecurity while incurring a 75% cost savings, and also provides significant social and environmental benefits.

Food Rescue – Feasibility to the National Economy

The rescue of 600,000 tons of food annually, constituting 25% of all food waste in Israel, would fully bridge the food consumption gap between the normative expenditure of the general population and those suffering from food insecurity. The cost of rescuing food is estimated at 1.4 NIS/kg. An investment of 840 million NIS would therefore rescue 3 billion NIS worth of food, equivalent to the total gap of food consumption.

Food rescue is clearly preferable compared to the alternative of attempting to bridge this food insecurity gap by means of allocations, donations, subsidies or support for the needy. Without food rescue, it would require an annual cost of 3 billion NIS to fully finance this gap. Food rescue allows for reaching a similar social goal at a significantly lower cost – 840 million NIS annually. Specifically, food rescue alleviates food insecurity while incurring a 75% cost savings, and also provides significant social and environmental benefits.

The principles of economic theory dictate that income received in goods (income in kind) is an

For the national economy, such efforts would generate a value of 2 billion NIS annually, constituting the surplus value of rescued food over the food rescue costs

inferior alternative to monetary income, as it deprives those receiving support of the freedom to allocate resources according to their full range of needs. Therefore, in principle, the general tendency is to choose the allocation of monetary support over the direct provision of products.

However, food rescue entails unique circumstances in which there is a clear economic preference for supporting the needy with products over money. This advantage stems from the specific characteristics involved in transforming waste into food, meaning that every shekel invested in food rescue generates a direct economic value 3.6 higher than the cost. Moreover, taking into consideration the FAO estimates of external environmental and social impact, the increased benefit to the economy is seven times that of the cost.

In this context, it should be noted that the food insecure also suffer from financial insecurity, evident in consumption gaps of other basic necessities (housing, health, education, etc.). It is reasonable to assume that in case of food rescue, households would then choose to allocate some of the increased income to consume other goods. Socially speaking, these households view consumption of such products as prerequisites for ensuring their financial security. Therefore, beyond the direct value of the food distributed to them, they also benefit from now having additional resources to address other basic needs and services.

Food rescue entails unique circumstances in which there is a clear economic preference for supporting the needy with products over money. This advantage stems from the specific characteristics involved in transforming waste into food, meaning that every shekel invested in food rescue generates a direct economic value 3.6 higher than the cost.

In September, 2015 the US government established a national food waste reduction goal of 50% within 15 years. Our analysis shows that rescuing 25% of food waste in Israel and its subsequent contribution to 450,000 households suffering from food insecurity, would fully cover the consumption gap relative to normative expenditure for these households. For the national economy, such efforts would generate a value of 2.1 billion NIS annually, constituting the surplus value of rescued food over the food rescue costs. This is even prior to considering the added benefits to the national economy in terms of poverty and inequality reduction, and before the external environmental

impacts are factored.

It should be emphasized that incremental implementation of a 50% national food waste reduction goal, spanning a 15-year period, is not expected to reduce the volume of agricultural production in Israel compared to current conditions. According to our estimates, should such a rescue goal be realized fully, domestic demand for agricultural produce is expected to increase by approximately 0.5% on average per year in real terms, even prior to the increase of domestic demand for food resulting from food rescue and its distribution to the needy.

*Assuming conservative estimates of zero increase in per capita domestic food consumption, and in the extreme scenario whereby food rescue fully replaces domestic demand.

Food Rescue – Summary of Feasibility Estimate to National Economy NIS in Millions Annually

Percentage of Rescued Food from Food Loss	1% (currently)	5%	10%	25%
Recovered Food (in tons)	20,000	100,000	200,000	600,000
Food Rescued Share of Food Insecurity Gap	4%	20%	40%	100%
Value of Rescued Food	120	600	1,200	3,000
Cost of Food Rescue	28	140	280	840
Benefit to National Economy (before external factors)	92	460	920	2,160
Environmental-Social Contribution (FAO)	100	500	1,000	3,000
Total Value of Food Rescue to National Economy	192	960	1,920	5,160



***Food Waste –
How much food is
wasted in Israel?***

75% *Fruits and vegetables account for 75% of food loss in Israel.*

**Food Waste –
How much food is wasted in Israel?**

Food waste estimates in Israel are based on a unique model of the value chain in domestic food production. Food waste in Israel is estimated at approximately 2.45 million tons annually, constituting 35% of overall domestic food production. In terms of quantities, roughly 75% of that food waste is in fruit and vegetables. A comprehensive value chain model for various food production and consumption stages was designed to assess food waste and the potential

for food rescue in Israel. This model is based on a bottom-up approach, and includes analysis of data relevant to agricultural production, import, export, industry, distribution, and a sample of consumption patterns of 50 various foods*.

Input and output analysis was conducted for each of the food groups in terms of quantity of gross agricultural production and rate of waste, in each of the four value chain stages.

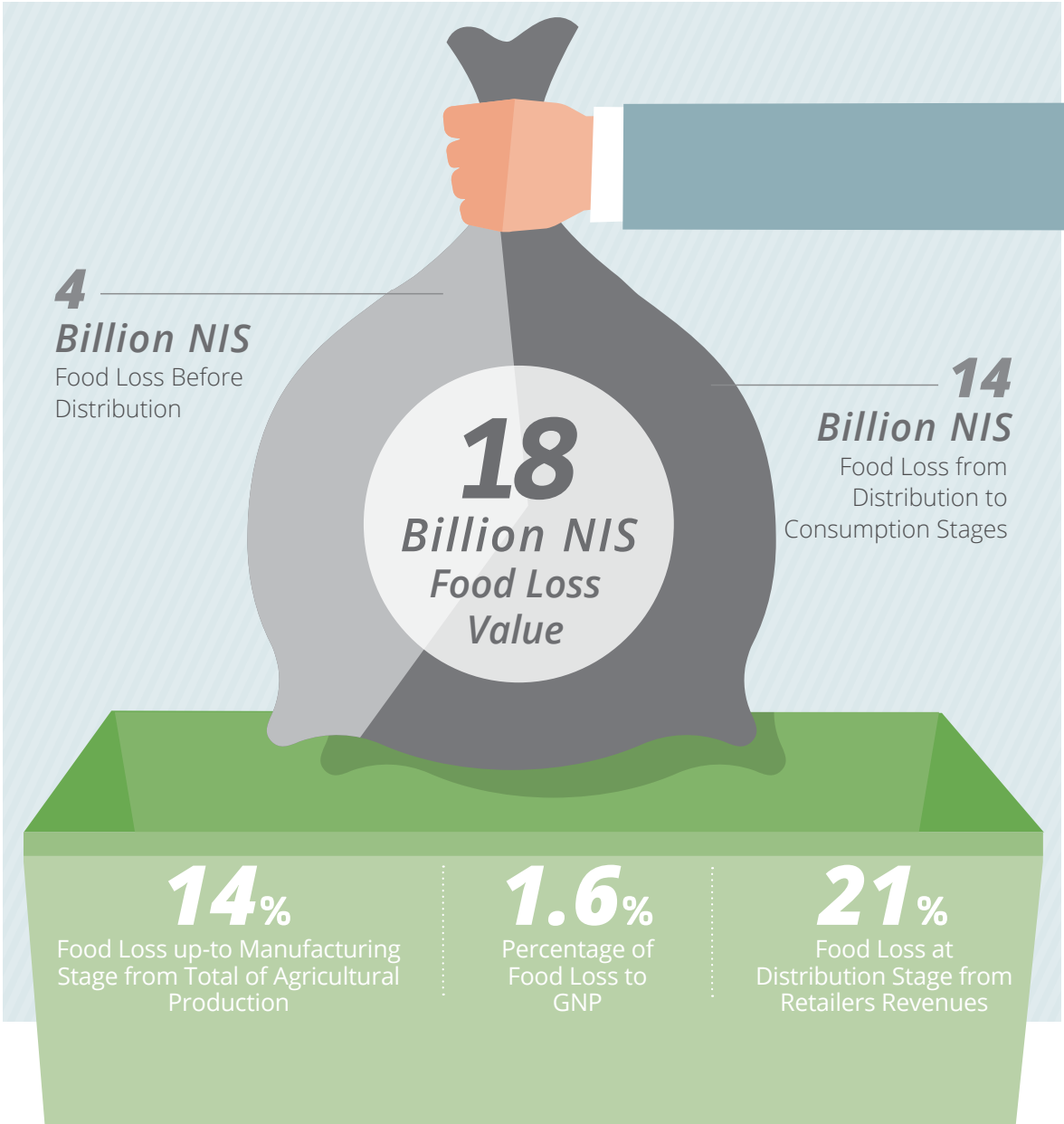
* We are aware such estimates may include deviations or inaccuracies that are inevitable in view of lacking any official data. Additionally, the volume of annual food waste also depends on random variables, such as weather conditions, natural events and pests, deviations in demand, etc. The data presented here is based on an annual analysis and average weather conditions. It does not include impact of singular events or deviations from the norm. This data is indicative and intended to serve as the basis for public debate, and further research and study.

Food Loss Estimate in Israel 2015 In Shekels Per Household						
Household Loss (monthly NIS)	Agriculture	Processing & Packaging	Industry	Distribution	Consumption	Total
Fruit & Vegetables	75	29	7	116	121	348
Grains & Legumes	7	2	1	10	79	99
Meat, Fish & Eggs	8	0	13	38	80	139
Milk & Dairy	4	1	1	2	21	29
Total	94	31	22	167	301	616

The overall food waste estimate, and estimates of specific foods, was based on the total waste incurred for each of the products and stages. One of the major challenges of analyzing food waste and the potential for food rescue in Israel is the lack of any data-gathering mechanisms, or monitoring of relevant data. This absence of data was also extensively discussed in the 2014 State Comptroller's Report. The data regarding food waste presented in this report is based on































estimates we conducted, weighing a wide range of information sources and statistics available, including conversations and interviews with experts in the field, study findings and results of previous reviews, international comparison studies and more. We hope that raising awareness of food rescue, while concurrently setting national food waste reduction goals, will facilitate extension of this database and associated estimates.

*The Loss estimation is based, among other sources, on a waste survey conducted by Dr. Ron Porat (Volcanic Institute, 2015)



Food Value Chain - Share of Food Loss in Each Stage

Loss percentage figures were rounded for presentation purposes

	 Agriculture	 Processing & Packaging	 Industry	 Net Import non-food uses deducted	 Distribution	 Consumption
 פירות וירקות	15% (641 thousand ton) loss  4,325 thousand ton	7% (269 thousand ton) loss  3,684 thousand ton	8% (94 thousand ton) loss  1,220 thousand ton	52- thousand ton	12% (407 thousand ton) loss  3,269 thousand ton	16% (454 thousand ton) loss  2,863 thousand ton
 דגנים וקטניות	6% (28 thousand ton) loss  509 thousand ton	4% (18 thousand ton) loss  481 thousand ton	2% (10 thousand ton) loss  463 thousand ton	897+ thousand ton	2% (24 thousand ton) loss  1,350 thousand ton	15% (193 thousand ton) loss  1,327 thousand ton
 בשר, דגים וביצים	3% (23 thousand ton) loss  684 thousand ton	1% (5 thousand ton) loss  661 thousand ton	5% (33 thousand ton) loss  657 thousand ton	138+ thousand ton	4% (34 thousand ton) loss  762 thousand ton	9% (68 thousand ton) loss  729 thousand ton
 חלב ומוצריו	4% (55 thousand ton) loss  1,578 thousand ton	1% (8 thousand ton) loss  1,523 thousand ton	1% (18 thousand ton) loss  1,515 thousand ton	61+ thousand ton	1% (8 thousand ton) loss  1,558 thousand ton	5% (70 thousand ton) loss  1,550 thousand ton

There is a great measure of variance in food waste among the different foods reviewed, as well as in the stage in which such losses are incurred. On average, there is approximately 40% waste in all food types in the initial stages of production, where produce is grown and then packaged. We estimated waste in these stages according to average proceeds to farmers. An additional 60% of waste is incurred in latter stages of the food value chain. Waste estimates for these stages are based on retail food prices. We estimate the economic value of food waste in Israel in 2015 at approximately 18 billion NIS, constituting 1.6% of domestic product.

Food waste can be divided into two stages of the food value chain:

1 From initial agricultural production to final stage of industrial food processing (food waste in production)

2 From distribution and retailing to final loss at the consumer level (food waste in consumption)

The value of food waste in initial stages, up until distribution, is estimated at approximately 4 billion NIS, constituting 14% of overall domestic agricultural produce in Israel. In 2014, this translated to 30 billion NIS.

The total of food waste in the latter stage, from packing houses to final household or institutional consumers, is approximately 14 billion NIS, constituting about 21% of food retail revenues in Israel.

The relative importance of fruit and vegetable waste in Israel stems from the high percentage of fresh produce in total domestic agricultural production, and the high waste rate of 45% throughout the value stages. This high waste rate in fruit and vegetables is not exclusive to the Israeli economy. Compared internationally, Israel has a similar waste rate in

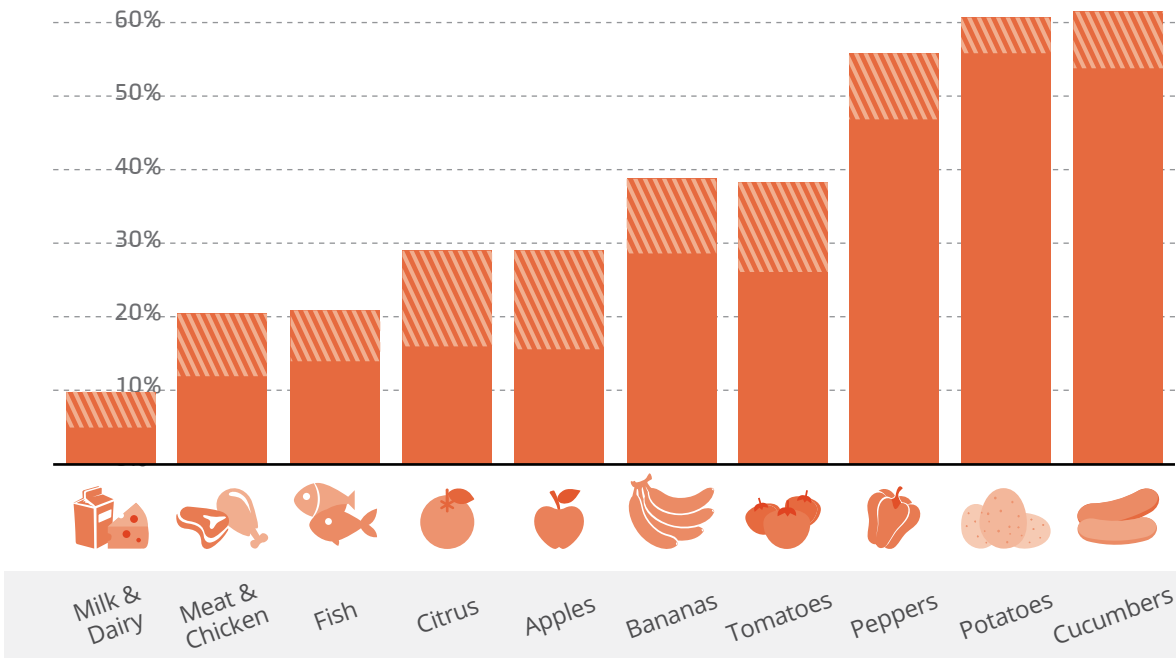
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this category to Europe. Israel has an overall lower waste rate than the US. Compared to the US there is less waste during the production and consumption stages, but greater waste in the intermediary stages.

Total food waste in all value chain stages, translates to a loss of 84 kg of food per household per month, and constitutes an equivalent monthly loss of 616 NIS per household. Quantitatively speaking, approximately 68% of this waste is incurred during production, manufacturing and distribution, prior to food reaching household or institutional consumers. In monetary values, roughly 50% is lost, or wasted, during consumption.

Food Waste Estimate in Israel - Select Products

Loss in processing Consumption Loss

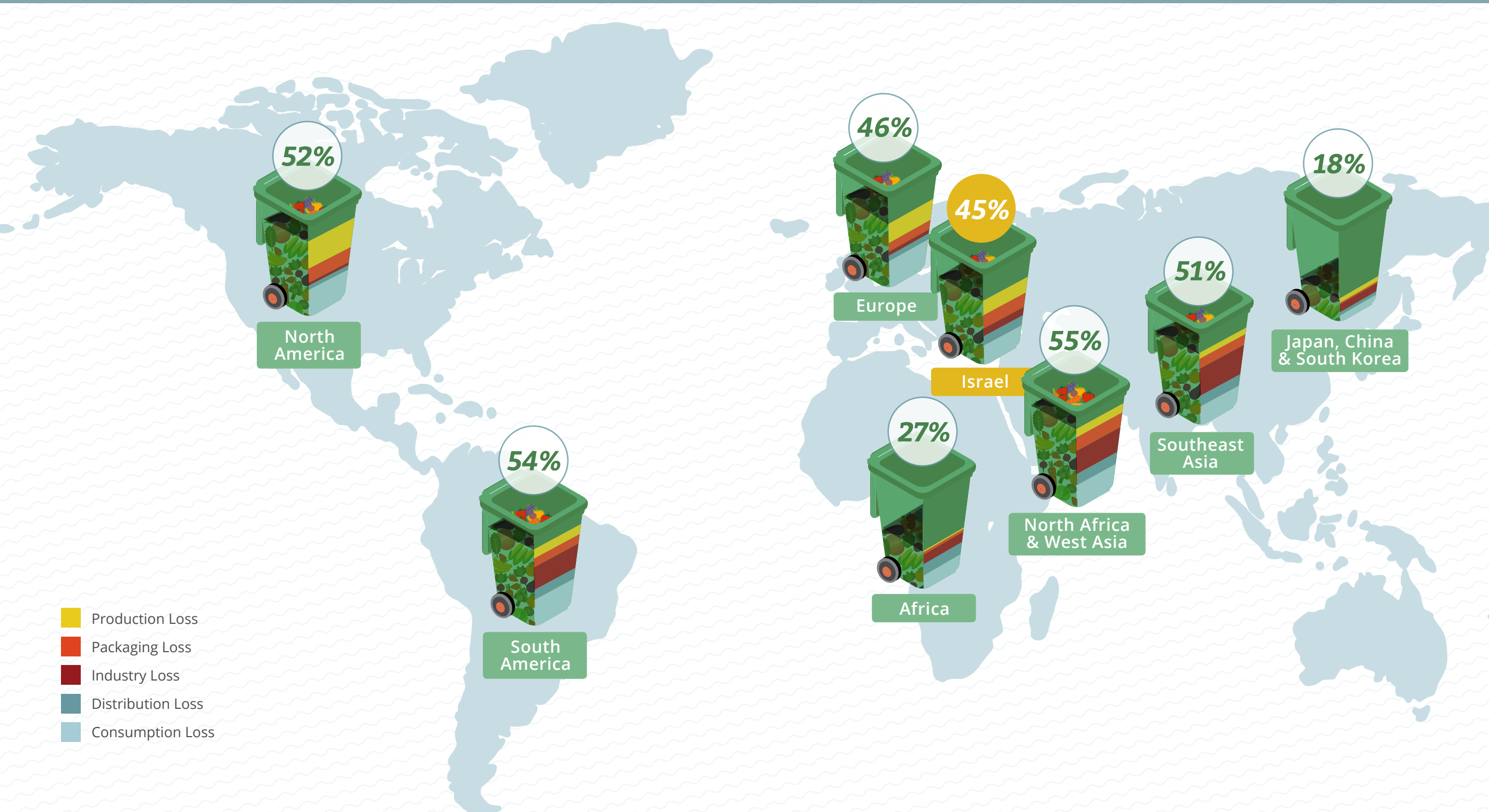


Food Loss Estimate in Israel 2015 Thousands of Tons

	Agriculture	Processing & Packaging	Industry	Distribution	Consumption	Total
Fruit & Vegetables	641	269	94	407	454	1,865
Grains & Legumes	28	18	10	24	193	272
Meat, Fish & Eggs	23	5	33	34	68	162
Milk & Dairy	55	8	18	8	70	159
Total	748	299	155	472	784	2,458

International Comparison of Fruit/Vegetable Waste Loss

השוואה בינלאומית של שיעור האובדן בפירות וירקות





***Food Waste –
How much food
can be rescued?***

1.6% of Israel's GDP is lost along the stages of production, distribution and consumption of food.

Food Waste – How much food can be rescued?

Roughly 35% of food produced in Israel is lost, or wasted, during the production, distribution and consumption stages, totaling 2.5 million tons annually. This translates to food losses valued at 18 billion NIS, equivalent to 1.6% of GDP. About half of this waste is considered unworthy of human consumption due to natural deterioration, damage during the production processes and the like, and are not considered potentially rescuable.

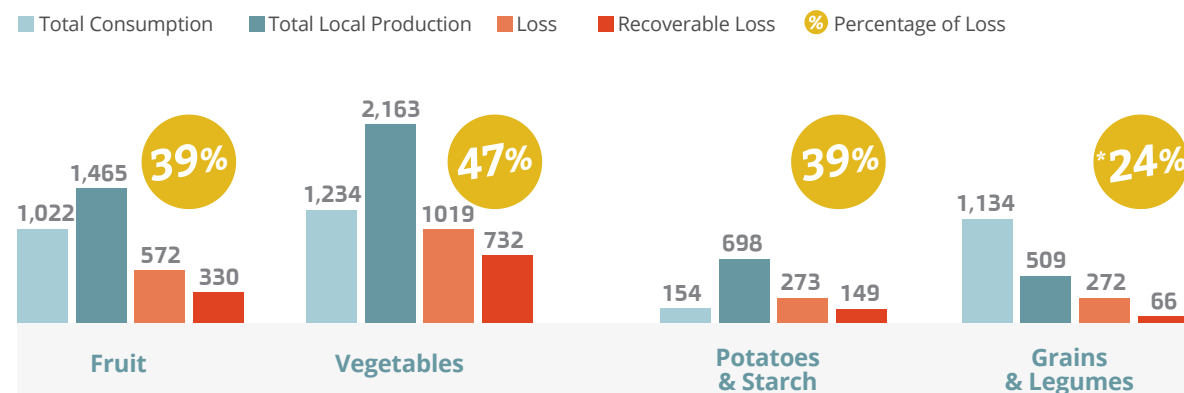
In terms of food rescue, the most important component are edible foods (fit for consumption with nutritional and health benefits that do not reach consumers). There are various reasons for loss in each of the stages of the food value chain. The common denominator is lack of

economic viability to food producers (i.e. farmers, industrialists, distributors, etc.) to invest additional resources in the more advanced stages of the production and distribution chain.

It is evidently clear that zero food waste is an impossible goal. However, reducing food waste, either by prevention or by rescuing surplus, should be a primary public objective..

Estimates of food fit for rescue is derived from BDO's food value chain model designed specifically for the food industry. Classification into rescuable (worthy of consumption) vs. unrescuable food were analyzed according to each food type, and their loss rates, in each of the value chain stages.

Recoverable Food Estimate in Israel 2015 thousands of tons



*Grains and Legumes loss is presented as a share of consumption, due to high import levels

It is important to note that classification of rescuable foods does not address economic viability of rescue, but rather the technical ability to use this food waste to feed people. According to our estimate, roughly 50% of food waste is rescuable and can, given appropriate resources and economic viability, serve to feed needy populations suffering from food insecurity.

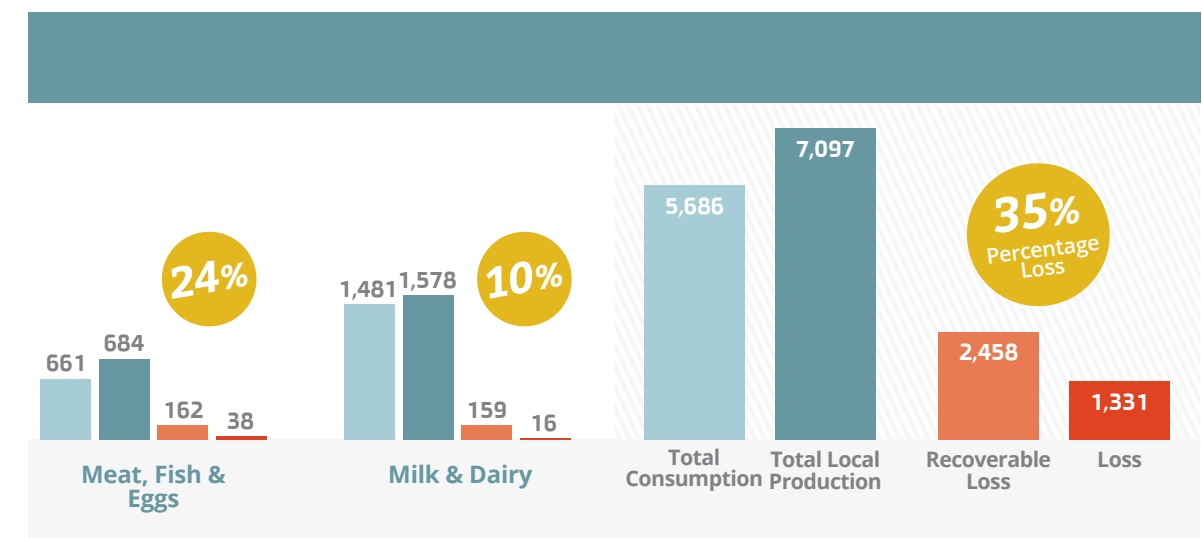
For analysis purposes, we did not classify food waste during household consumption as rescuable. There are various approaches to the issue of food waste in household consumption. Western culture is based on the notion of consumerism and prosperity, and it seems that consumers extract benefit (and enjoyment) not only from food consumption, but also from a range of selections and even excess. Economically, as long as consumers pay the full amount for purchased products, no restrictions should be placed on their consumption. The problem in the case of food consumption is that, while food production entails using natural resources and the exacting of environmental impact, its external costs are not calculated in the price paid by consumers for food - aspects that were not reviewed in our study. However, these circumstances may justify actions to reduce waste, such as by raising public awareness regarding the external repercussions of producing food that is left unconsumed.

Rescuable Food

- ✓ Unpicked edible agricultural produce
- ✓ Aesthetically flawed agricultural produce
- ✓ Agricultural produce not sold in wholesale markets
- ✓ Unsold food surplus in markets/stores
- ✓ Surplus prepared food from catering, industrial kitchens & restaurants
- ✓ Packaged food with flawed or damaged packaging
- ✓ Food nearing its sell-by date that will not be sold

Food Waste Unworthy of Human Consumption

- ✗ Sick livestock or carcasses
- ✗ Diseased food
- ✗ Damaged or contaminated food
- ✗ Spoiled food
- ✗ Production leftovers (peels, seeds, skin, fat)
- ✗ Food already served and left unconsumed





***Food Security – How much
food is required to close
the food consumption gap
in Israel?***

25%

Rescuing 25% of the food loss can bridge the entire gap in food consumption resulting from lack of food security in Israel.

Food Security – How much food is required to close the food consumption gap in Israel?

One of the greatest challenges facing the Israeli economy is the problem of inequality in distribution of income. The inequality level in Israel, measured by the Gini (Inequality) Index, is one of the highest of developed economies, excluding the US, Turkey, Chile, and Mexico. Food insecurity is one of the consequences of income inequality.

Relying on World Health Organization definitions, also used by the National Insurance Institute of Israel (NII), food security is based on three key pillars:

- 1

Food Availability:
Sufficient quantities of food available on a consistent basis
- 2

Food Access:
Sufficient resources to obtain appropriate foods for a nutritious diet
- 3

Food Use:
Awareness to proper use of food as well as adequate water and sanitation

Using these criteria, which are primarily subjective, the NII estimates that approximately 18% of Israel's population suffers from food insecurity; of this number, 10% in severe food insecurity, and an additional 8% in moderate or mild food insecurity. According to The Economist 2015 Global Food Security Index, Israel is ranked 11th in food insecurity among 34 member states of the

Organization of Economic Cooperation and Development (OECD).

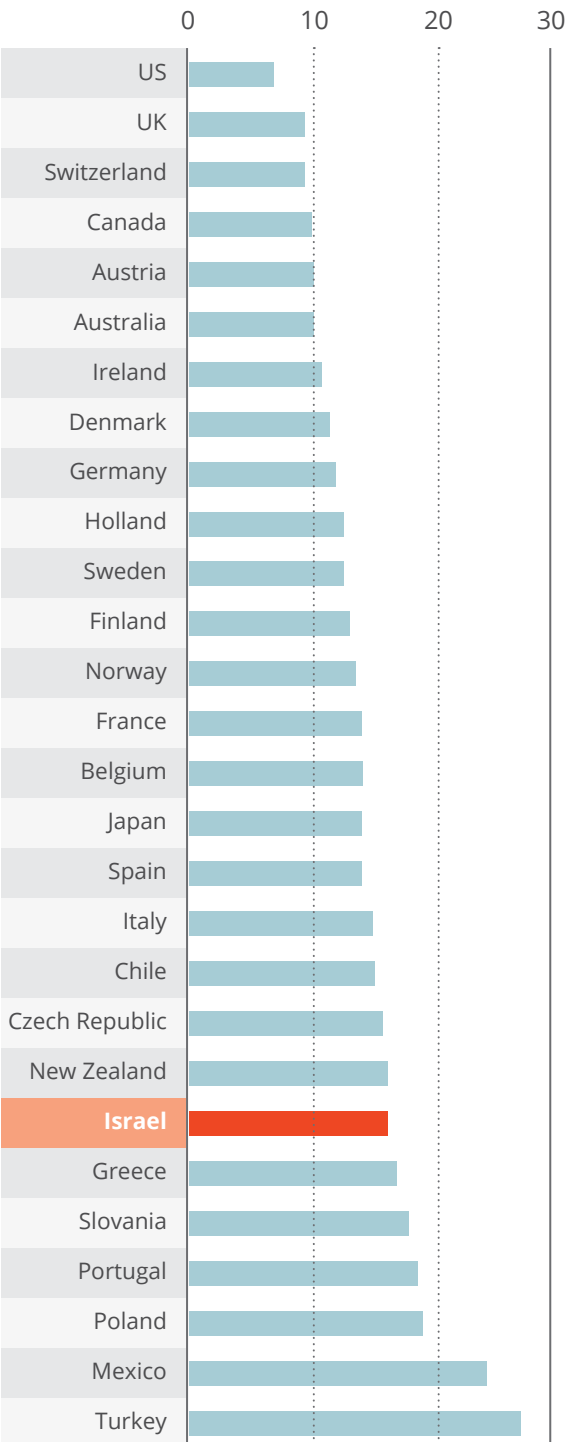
Comparison of inequality and food insecurity data indicates that the US and Israel have similarly high inequality and poverty levels, however paradoxically food security in the US is among the highest in the developed world.

It seems that the high US measure of food security,

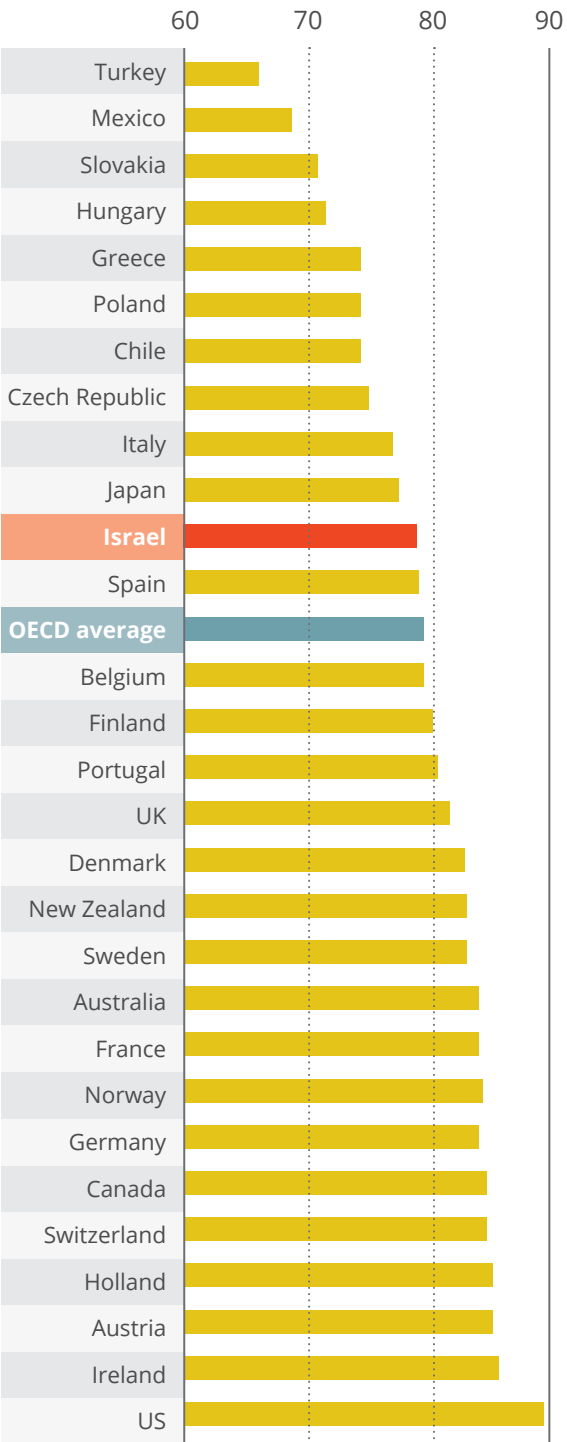
Israel's Ranking in Inequality and Food Security			
	Israel	OECD Index	OECD Average
Gini Index (inequality)	0.37	0.32	5
Poverty Rate	18.8%	11%	2
Food Security Index	78	79	11
(%) Food Expenditure to PCE	16%	14%	7

* Israel ranks among 34 member states. High rank = High inequality

Food Consumption - Calories per Capita



Food Security Index - International Comparison 2015



despite high general inequality, is the result of many years of public awareness to the problem of food insecurity, evident among other things by the American reliance on food stamp programs to ensure food provision to the needy.

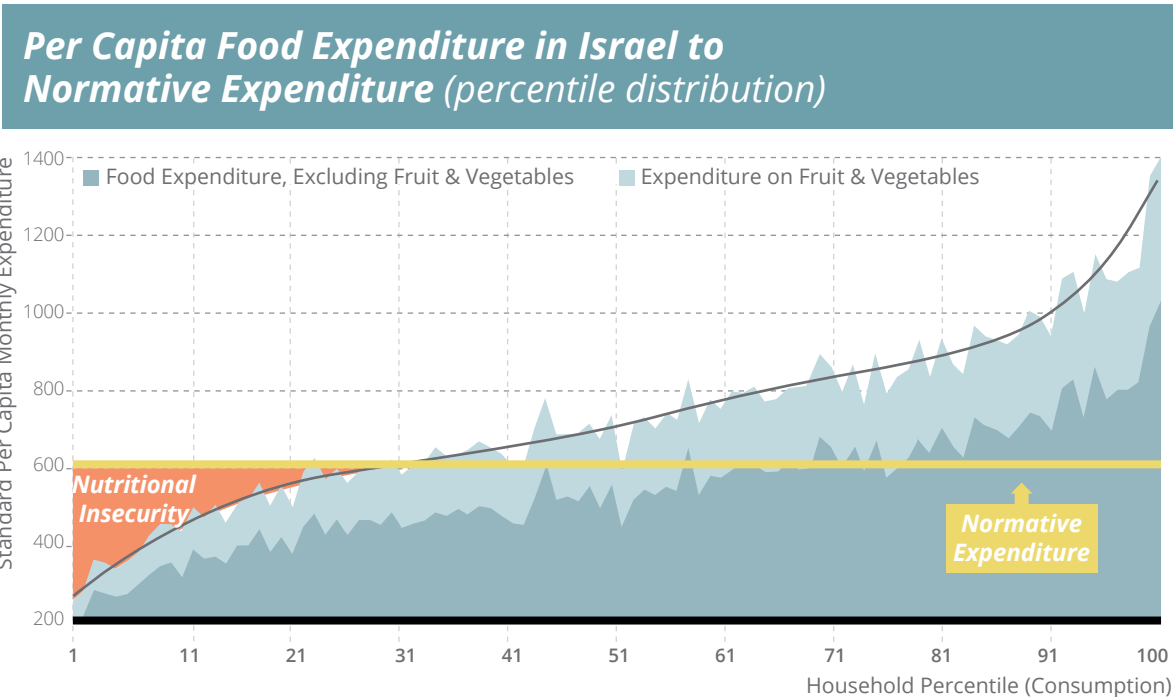
Furthermore, the US is a pioneer in instating food banks to save surplus and distribute it to underprivileged populations, and is a world leader in establishing policies to remove obstacles for food waste and reuse. As early as 1996, the US passed the Good Samaritan Food Donation Act to protect those involved in food rescue from litigation.

Despite similar inequality and poverty rates in Israel and the US, food expenses as part of the Personal Consumption Expenditure (PCE) in Israel is among the highest in the world, measured at 16% - a number two and half times that of the US. Therefore, a policy of food rescue and distribution to the underprivileged populace is an effective welfare policy particularly applicable to Israel, where a significant portion of household expenditure is allocated to food. The definition of food security is subjective.

In order to examine food rescue effectiveness as a policy measure to increase food security in Israel, we relied on the methodology of Chernichovsky and Regev to define normative food expenditure as a measure of expenditure that remains constant even with an increase to household income.

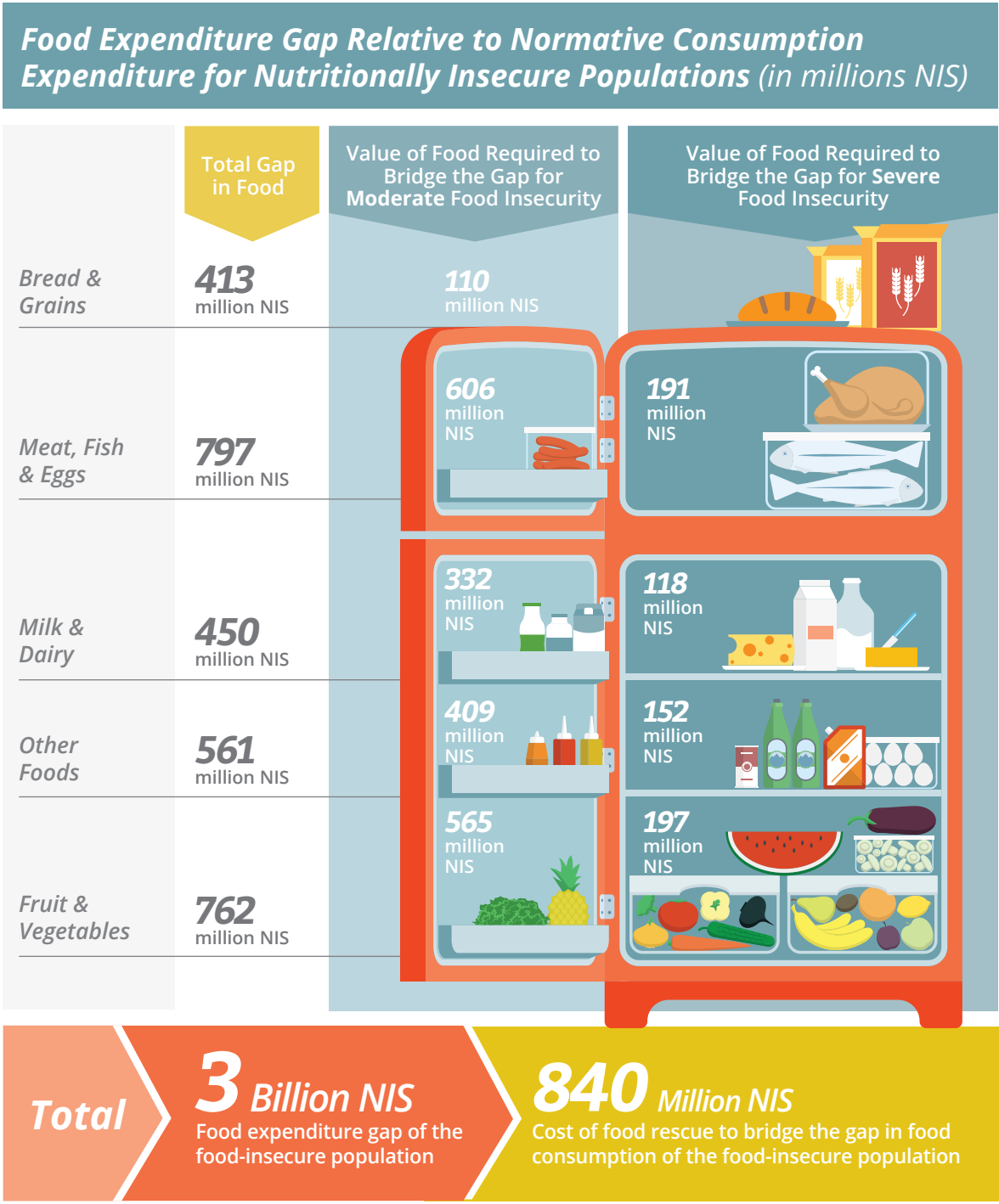
To examine normative food expenditure, we reviewed expenditure on food of the lowest percentiles relative to normative levels. Our analysis demonstrates that in the three lowest percentiles (in terms of standard per capita consumption), food expenditure was roughly half that of the normative level.

According to our estimates, the volume of food required to bridge the gap between actual food consumption of food insecure populations and normative consumption level (average levels of second-to-fifth percentiles), is valued at 3 billion NIS. The cost of eliminating this food expenditure gap relative to normative level for the severely food-insecure population (10% of Israeli households) is estimated at 2.2 billion NIS, with an additional 0.8 billion NIS required to assist populations experiencing moderate food insecurity.



The rescue of 600,000 tons of wasted food each year, constituting 25% of overall food waste in Israel, will enable the closing of the food gap in Israel. According to our estimate, 840 million NIS

would enable the rescue 3.3 billion NIS in food, equivalent to the gap between food expenditure of food insecure populations and normative expenditure levels.





***Obstacles and
Policies to Encourage
Food Rescue***

It is clear to everyone that fully eliminating food waste is an impractical goal. However, reducing food waste, either by waste prevention or rescue, is a central goal of the utmost importance in global public debate.

Obstacles and Policies to Encourage Food Rescue

Food waste results from a range of causes at each level of the food value chain. The primary reason relevant to all stages is lack of economic viability (to farmers, industry, distributors and others) to invest additional resources in the latter stages of the food production and distribution chain.

Lack of economic viability may stem from characteristics of the foods themselves, their production environment, or from market conditions. Food traits that lead to waste include aesthetically marred produce, for example fruit or vegetables that are either smaller or larger than accepted standards. Viability is also measured by a reduction in shelf life, as produce becomes overripe, shortening the length of time available for sale. Additionally, defects may occur during processing.

Low field or orchard yields, for whatever reason, may decrease the economic incentive to harvest even perfectly fit produce.

Market fluctuations play a role in determining viability as well. When supply drives prices down, the expected return on selling surplus may be lower than production costs.

During the distribution and retail stages, food waste may be caused by food passing its sell-by date, and is therefore disposed of. This is a loss that ostensibly cannot be rescued (whereby imprudent planning results in excess production). However, it seems that more careful planning of inventory

can allow food producers to predict which of their products are nearing their sell-by date but have low statistical probability of being sold, and transfer those for rescue before expiring.

We should note that, with the enactment of the Economic Arrangements Bill, a legislative process was started to permit donations of post sell-by-date foods to food rescue organizations, and further regulations by the Minister are expected on this issue.

It is clear to everyone that fully eliminating food waste is an impractical goal. However, reducing food waste, either by waste prevention or rescue, is a central goal of the utmost importance in global public debate.

The UN, with the US and various other countries, have established an official goal of 50% reduction of food waste by the year 2030. This is an important public declaration of intent, but also an indication that professional organizations and institutions believe a 50% reduction is both possible and realistic, however ambitious it may seem.

This is a clear case of market failure. Based solely on market prices, there may be no economic justification for food rescue. However, in terms of economic measures reflecting alternative value and nutritional benefits, food rescue has high economic viability.

In our opinion the initial measures required to increase the level of food rescue in Israel are as follows:

1 { Determining national food rescue goals
to reduce food waste by 50% by the year 2030, as specified by the UN. Setting a national goal carries more significance than merely raising awareness to the issue; it is a governmental commitment to act towards the realization of this objective. Furthermore, in addition to establishing such a goal, it is necessary to establish ongoing measurement and monitoring tools to review progress and implementation.

2 { Finalizing legislation to encourage food surplus rescue
as seen in the US Good Samaritan Food Donation Act. A law is needed that encourages food surplus donations and absolves NPOs and food donors from civil or criminal liability. Similar laws already exist in several countries. In 1996, the US passed a federal law exempting any person, corporation or government authority that donates food to NPOs in good faith from civil or criminal liability. This addresses wholesome foods that meet all quality and labeling standards but are not readily marketable due to appearance, age, freshness, grade, size, surplus, or other conditions (Bill Emerson Good Samaritan Food Donation Act).

3 { Requirement of food rescue of all governmental and government-financed institutions
requiring state budgeted bodies with kitchens catering to 1,000 or more patrons daily (either directly or through subcontractors) to collaborate with registered food rescue NPOs as a condition for government support (including defense agencies, school catering programs, government, companies, etc.).



Leket Israel The National Food Bank

Founded in 2003 by Mr. Joseph Gitler, Leket Israel is the only organization in Israel dedicated solely to rescuing food for the benefit of those in need. Standing at the forefront of food rescue, each year Leket rescues and redistributes tens of thousands of tons of food to needy clientele through its network of nonprofit organization (NPO) partners.

To attain such impact, Leket Israel rescues a range of food types from several different sectors: picking fresh produce straight from the field, collecting leftover agricultural produce from packing houses, rescuing meals from various prepared food suppliers, and recovering surplus manufactured food from industry.

Using Leket Israel's fleet of refrigerated trucks, rescued food is transported to two advanced logistics centers where the food is staged under optimal conditions. The organization's complex logistics network is responsible for efficiently

distributing the rescued food from the centers to NPOs throughout the country under strict quality control and food safety guidelines.

In an effort to enhance and support the health and well-being of the underprivileged, Leket Israel places special emphasis on distributing highly nutritious foods including fruits and vegetables, prepared meals, and other food products high in protein, calcium and vitamins.

Leket Israel's success is derived from the extraordinary generosity of more than sixty thousand volunteers from all over the world. This inspiring network of volunteers dedicate their time and effort to pick, harvest, collect, prepare, and distribute food.

Striving to fulfill a vision where all food surpluses are rescued, Leket Israel is constantly seeking new sources of rescuable food and working to expand its network of NPO partners.

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