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# IRAQ PRIVATE SECTOR GROWTH AND EMPLOYMENT GENERATION

March 15, 2006

## THE POTENTIAL FOR FOOD PROCESSING IN IRAQ



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## Executive Summary

The objective of this report is to provide market-oriented recommendations concerning which food processing industries should be developed in Iraq, both to avoid import dependency and to establish a competitive, job-creating agri-food sector. The development of a modern food processing industry could add \$10-15 billion to the Iraqi GDP, and should be a high priority for the newly elected government.

Developing certain agricultural sectors to meet demand more efficiently and economically than imports should be done quickly in order to avoid potentially devastating foreign expenditures. In only twenty five years Iraq will suffer a food crisis unless a disproportionate share of petroleum revenues is allocated to cover massive imports of basic foodstuffs. The market drivers identified in this analysis -- growing population, a diet richer in protein, and gradual demand for packaged food – are virtually irresistible.

Our analysis will deal with the poultry, dairy, edible oil, biscuit, tomato paste, and aquaculture sectors. We believe they should be given priority for the size of the opportunities they represent, and for their potential to create jobs. An integrated national strategy requires coordinating working teams in: Agriculture; food processing; investment promotion; and regulation of the food sector.

There are clear opportunities and priorities to be addressed:

1. An agriculture team should lead in: Improving productivity, especially for wheat, but also for vegetables; a feasibility study to determine appropriate varieties of oil seeds to achieve self-sufficiency in edible oils, presently 100% imported, and to supply livestock feed; development of the aquaculture sector, an easy and quick means to develop a source of protein.
2. A processed food team must lead in developing a model for the dairy and poultry industries, considering as models the integrated dairy system utilized in Saudi Arabia and the decentralized poultry breeding system employed in Brazil.
3. The Iraq Investment Promotion Agency should: Target potential investors in Turkey in the biscuit and snack, tomato paste, and dairy sectors; develop a reliable and current sectoral data base and information system as tools for promoting investment in these sectors.
4. Government officials and ministries of the government must develop and enforce a new and modern food code and a food regulation protocol.
5. Finally, the existing government food distribution system should be converted into an instrument to create demand for a new Iraqi food processing industry in its nascent period.

## **Notes and Caveat**

1. Normally a study of this nature would require direct visits to retail outlets in a given country – supermarkets, small stores, the local souk, and so forth. In countries with strong self-service retailers such as a Wal-mart or Carrefour, the trends and characteristics of the processed food industry can probably be understood simply by analyzing the stocks on their shelves. Such findings would then be supplemented by statistics on imports, exports, consumption, a sector specific analysis, and possibly some additional market research.

The security situation in Iraq makes such first hand surveys impossible – at least for recognizable foreigners. Therefore, rather than visit retail outlets ourselves we relied initially on interviews with consumers, aimed at gaining an insight into current Iraqi food habits, trends, supply constraints, buying patterns, and changes that occurred in the last fifteen years. In addition, local staff did survey retail outlets for us and provided data on what is presently available in the marketplace. Our initial conclusions about diet and the market were then integrated with data and research from international organizations such as the World Bank, UNDP, FAO and other sources.

No data from any source were simply accepted passively. On the contrary, all figures were analyzed and cross checked with other data for consistency. As a result, some data have simply been discarded, other figures modified, and yet others accepted as consistent with other sources. In some of the tables contained in the study no reference or source is reported because many data have been deduced by testing all available information for consistency. While perhaps not as rigorous in theory as a more standard methodology, given the wildly varying statistics and claims about the Iraqi economy and marketplace, the unreliability of the press, and the paucity of reliable official data, this was the most suitable approach to determining the actual nature of the market and the local diet.

2. This study could well have been named *The Potential for Agri- Food Processing in Iraq*, as unquestionably many of the subjects analyzed in it concern agriculture, and it is impossible to draw a clear line between food processing and agriculture: Most processed products that are viable in Iraq in the short term are actually semi-commodities, possibly packaged and with little added value, and with strong direct links to agriculture. Furthermore, the development of some processed food sectors – edible oils, dairy, and poultry for example – heavily depends on possible improvements in agriculture that involve strategic land allocation. Hence this study presents a broad view of processed food and agriculture. Decisions in the processed food sector will certainly be affected by, and depend on, what crops are to be given priority in the course of Iraq's agricultural reconstruction and development.

## 1. THE CHALLENGE OF FOOD PROCESSING IN IRAQ

### 1.1 Introduction

With the exception of Iraq, the contribution of agriculture and food processing to GDP is strong in all Middle East countries, even including petroleum-driven economies such as those of Saudi Arabia and the UAE. The development of a modern processed food industry could add \$10-15 billion to the Iraqi GDP, and therefore should be a high priority for the newly elected government. This will apply particularly if the country enters a period of greater stability and growth, including the establishment of a fully functioning market economy.

It is also clear that developing certain agricultural sectors in Iraq to meet demand more efficiently and economically than today's imported products should be done as quickly as possible. Failing allocation of a huge percentage of petroleum revenue to finance massive imports of basic foodstuffs, Iraq will experience a food crisis within one generation.

Our analysis will deal with the poultry, dairy, edible oil, biscuit, tomato paste, aquaculture and small ruminant sectors. These sectors and sub-sectors should be given priority in Iraq, not only for the size of the opportunity they represent, but because of their potential to create jobs. In addition, we believe there is an urgent need to revolutionize the methods used to cultivate cereals (especially wheat) and vegetables, to be undertaken under the supervision of competent agronomists.

The objective of this document is to provide market oriented guidelines and recommendations about which food industries should be developed in the country, both to avoid import dependency and to establish a competitive, job-creating food processing sector.

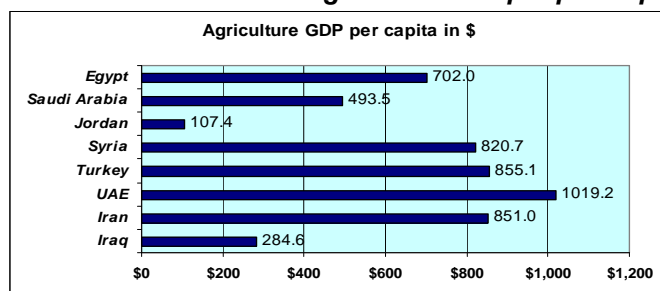
### 1.2 Food Production in the Middle East

In the oil rich economies of the Middle East food processing is actually stronger than agriculture *per se*. Only Iraq and Jordan share a unique combination of low agricultural output and the virtual absence of a food processing industry.

**Table 1.1 Agriculture Contributions to GDP in the Middle East.**

<b>INDICATORS 2004</b>	<b>Iraq</b>	<b>Iran</b>	<b>UAE</b>	<b>Turkey</b>	<b>Syria</b>	<b>Jordan</b>	<b>Saudi Arabia</b>	<b>Egypt</b>
Pop ( <i>Millions</i> )	26	68	2.5	69.6	18.4	5.7	26.4	77.5
GDP PPP (000 Millions \$)	54.4	516.7	63.7	508.7	60.4	25.5	310.2	316.3
Agricultural output as % of GDP	13.6%	11.2%	4.0%	11.7%	25.0%	2.4%	4.2%	17.2%
Agricultural output (000 Millions \$)	7.4	57.9	2.5	59.5	15.1	0.6	13	54.4
<b>Agriculture production/person \$</b>	<b>285</b>	<b>851</b>	<b>1019</b>	<b>855</b>	<b>821</b>	<b>107</b>	<b>493</b>	<b>702</b>
<b>Index GDP-Ag./Pop.</b>	<b>100</b>	<b>299</b>	<b>358</b>	<b>301</b>	<b>288</b>	<b>38</b>	<b>173</b>	<b>247</b>
% of labor force	30%	30%	7%	36%	30%	5%	12%	32%

Source: CIA, World Factbook, 2004-2005. The Economist Sectoral Intelligence Service.

**Table 1.2 Middle East: Agricultural Output per Capita**

Source: CIA, World Factbook, 2004-2005. The Economist Sectoral Intelligence Service.

Agricultural output per capita in Iraq was only \$285 in 2004, compared with \$851 in Iran, \$820 in Syria, \$702 in Egypt, and \$855 Turkey. It is also considerably lower than in Saudi Arabia and the UAE, with \$493 and \$1091 respectively.

The contribution of the processed food industry to Iraq's GDP is currently a negligible 0.8%, far lower than in neighboring Syria and Iran, with 11.5% and 14.6% respectively, and also lagging behind the UAE and Saudi Arabia; it exceeds only that of Jordan, which has an economy focused traditionally on services.

**Table 1.3 Contribution of Food Processing to GDP in the Middle East**

INDICATORS 2004	Iraq	Iran	UAE	Turkey	Syria	Jordan	Saudi Arabia	Egypt
% Agriculture GDP	13.6%	11.2%	4.0%	11.7%	25.0%	2.4%	4.2%	17.2%
Ag. GDP (000 Millions \$)	7.4	57.9	2.5	59.5	15.1	0.6	13	54.4
Ag. GDP per capita \$	285	851	1019	855	821	107	494	702
<b>Processed Food as % GDP</b>	<b>0.8%</b>	<b>14.6%</b>	<b>4.7%</b>	<b>18.5%</b>	<b>11.5%</b>	<b>0.6%</b>	<b>5.6%</b>	<b>18.6%</b>
<b>Proc. Food GDP (000 Millions \$)</b>	<b>0.44</b>	<b>75.23</b>	<b>2.99</b>	<b>94.04</b>	<b>6.94</b>	<b>0.15</b>	<b>17.46</b>	<b>58.76</b>

Source: CIA, World Factbook, 2004-2005. The Economist Sectoral intelligence Service.

## **2. THE FOOD PROCESSING INDUSTRY IN IRAQ**

### **2.1 IRAQ'S FOOD PROCESSING MARKETS: CONSTRAINTS and OPPORTUNITIES**

Iraq suffers from numerous constraints in the food processing sector. There are probably no more than a handful of sectors that are significant from the standpoint of value, the potential for job creation, and the ability of Iraq to produce or process food on a competitive basis compared to imports.

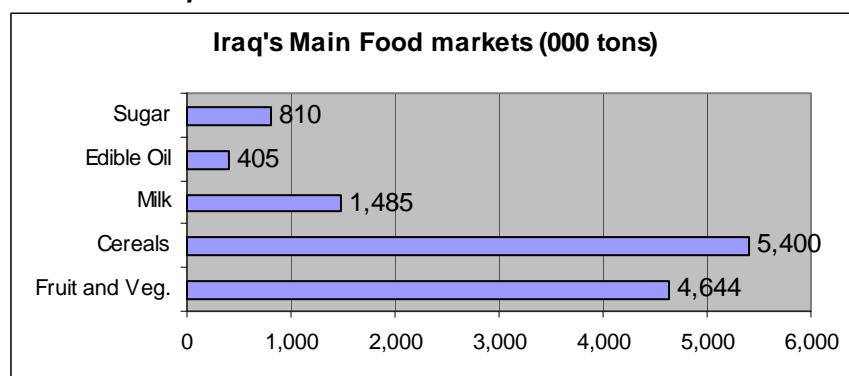
1. First and paramount among the existing constraints is low real disposable income. The processed food sector thrives only in high volume markets. Our analysis will show that in today's Iraq only a few basic food markets have achieved the critical mass necessary to justify the heavy capital investments that are required to match the level of R.o.I investors expect in the industry. The profile of Iraq's demand for food is still extremely basic and certainly not sophisticated.
2. The pervasive presence of the Public Distribution System (PDS), a publicly funded, basic food basket program, is a major factor hindering potentially efficient, private, market-oriented investment in the sector.
3. There is no regulatory scheme in the food sector, not even a basic food code. Without a reasonable regulatory regime there is no possibility of fair competition in the marketplace.
4. The available data and statistics are faulty, incomplete, and often non-existent, and investment decisions everywhere in the world ultimately depend on data and information about the market.

Nonetheless, there are also good opportunities for investment in Iraq just around the corner, and they are driven by powerful forces that have been observed in recent decades around the world:

1. Iraq's population will boom, reaching almost forty million people by 2025, and perhaps as much as fifty million in 2040. There is also a huge and growing population of young people whose consumption pattern will tend to be similar to that of western world.
2. As time passes, more affluent Iraqis will return to their traditional, protein-rich diet.
3. Despite low disposable income, some early entrants in the packaged food sector will soon gain consumer acceptance, as have imported products already.

### **2.2 IRAQ'S FOOD PROCESSING MARKETS: PRIMARY CONSTRAINTS**

Iraq's food markets and current nutritional levels have suffered from the effects of instability, war, sanctions, state mismanagement and interference (the PDS), poor agricultural productivity and output, low disposable income, and irregular supply. As a result only a few food markets have emerged with sufficient volume and the critical mass to attract attention and potentially draw investment:

**Table 2.1 Iraq: Main Food Markets.**

In addition, only fruit, vegetable, edible oil, and cereal consumption (especially wheat), are in line with regional standards, while the consumption of milk, meat eggs, cheese, pulses, and sugar is lower than is typical of the region -- and also much lower than it was in Iraq before the 1991 invasion of Kuwait.

**Table 2.2 Iraq's and Middle East Food per capita Consumption. Iraq's Demand, Imports and Production Markets**

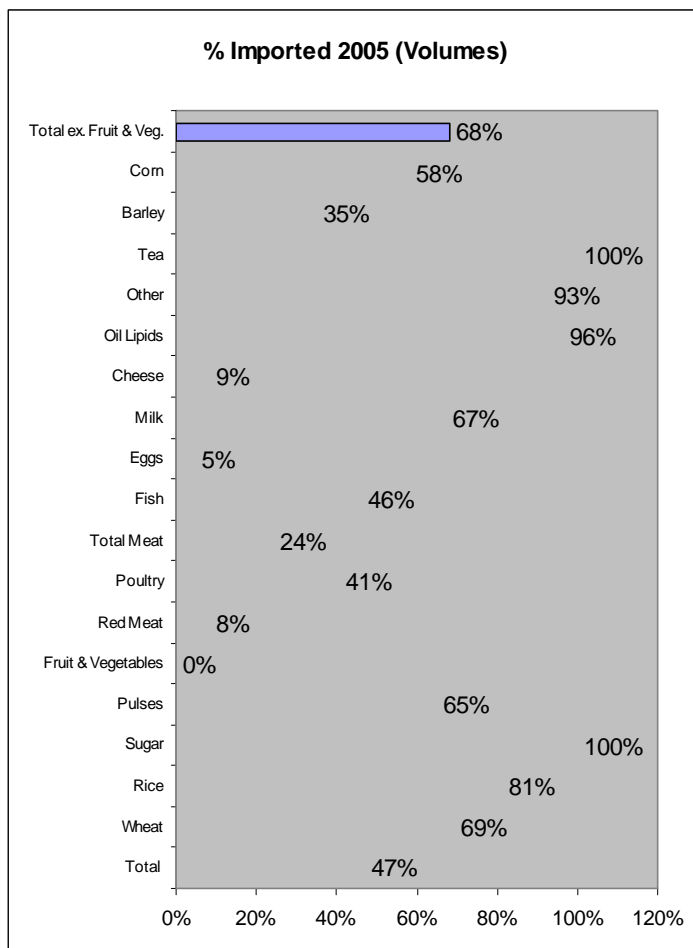
	CONSUMPTION kg/person							Market. 000 tons	Prod. 000 tons	Imports est. 000 tons	Imports Millions \$	Imports %
	Iraq Pre- Embargo	Egypt	GCC	Jordan	Syria	Avg.	Iraq					
	1992	2002	2002	2002	2002	2002	2005					
Wheat	<b>170</b>	232.6	156	188.9	178	184.0	<b>160</b>	<b>4,320</b>	<b>1,320</b>	<b>3,000</b>	<b>465</b>	<b>69%</b>
Potatoes	<b>18</b>	13.2	9	26	16	17.1	<b>16</b>	<b>432</b>	<b>432</b>	<b>0</b>	<b>0</b>	<b>0%</b>
Rice	<b>44</b>	45.5	56	47	42	49.1	<b>40</b>	<b>1,080</b>	<b>200</b>	<b>880</b>	<b>226</b>	<b>81%</b>
Sugar	<b>35</b>	58.9	65	47	45	51.2	<b>30</b>	<b>810</b>	<b>0</b>	<b>810</b>	<b>168</b>	<b>100%</b>
Pulses	<b>12</b>	11	14	10.9	12.7	12.0	<b>4</b>	<b>108</b>	<b>38</b>	<b>70</b>	<b>25</b>	<b>65%</b>
Vegetables	<b>102</b>	142.3	88	74.3	91.2	109.6	<b>85</b>	<b>2,295</b>	<b>2,295</b>	<b>n.a*</b>	<b>n.a</b>	<b>0%</b>
Fruit	<b>105</b>	102.6	79	86.4	97.2	106.9	<b>87</b>	<b>2,349</b>	<b>2,349</b>	<b>n.a*</b>	<b>n.a</b>	<b>0%</b>
Red meat	<b>11</b>	18.2	12	12.7	10.8	13.5	<b>4.5</b>	<b>122</b>	<b>152</b>	<b>10</b>	<b>13</b>	<b>8%</b>
Poultry	<b>15</b>	7.8	38	23.5	19	21.1	<b>4.5</b>	<b>122</b>	<b>72</b>	<b>50</b>	<b>50</b>	<b>41%</b>
Total meat	<b>26</b>	26	50	36.2	29.8	34.6	<b>10.5</b>	<b>244</b>	<b>224</b>	<b>60</b>	<b>63</b>	<b>24%</b>
Fish	<b>2.5</b>	8.3	12	3.7	4.5	6.2	<b>0.8</b>	<b>22</b>	<b>12</b>	<b>10</b>	<b>18</b>	<b>46%</b>
Eggs	<b>5.5</b>	3.6	7.8	6.8	6	6.2	<b>3.9</b>	<b>105</b>	<b>100</b>	<b>5</b>	<b>n.a</b>	<b>5%</b>
Milk	<b>60</b>	51.2	96.4	71.3	79.5	75.5	<b>55</b>	<b>1,485</b>	<b>485</b>	<b>1,000</b>	<b>508</b>	<b>67%</b>
Cheese	<b>4</b>		7.8				<b>1.3</b>	<b>35</b>	<b>32</b>	<b>3</b>	<b>6</b>	<b>9%</b>
Edible Oil	<b>15</b>	15.7	17	14.7	13.9	15.4	<b>15</b>	<b>405</b>	<b>0</b>	<b>405</b>	<b>278</b>	<b>100%</b>
Other	<b>3</b>	4	6	3.2	3.2	3.9	<b>2</b>	<b>54</b>	<b>4</b>	<b>50</b>	<b>55</b>	<b>93%</b>
Tea	<b>2.2</b>						<b>2.2</b>	<b>59</b>	<b>0</b>	<b>59</b>	<b>99</b>	<b>99%</b>
Barley	<b>70</b>						<b>40</b>	<b>1,080</b>	<b>700</b>	<b>380</b>	<b>52</b>	<b>35%</b>
Maize	<b>25</b>						<b>8</b>	<b>216</b>	<b>90</b>	<b>126</b>	<b>13</b>	<b>58%</b>
<b>TOTAL</b>								<b>14,666</b>	<b>7,864</b>	<b>6,858</b>	<b>1,976</b>	<b>47%</b>

\* There is growing evidence of some imports of fruit & vegetables – especially potatoes and cucumbers – gaining strength in the last quarter 2005. The volumes are not recorded accurately. Cucumbers appear not to exceed a small percentage of domestic production, but imported potatoes seem to be pushing out a significant part of domestic production.

Furthermore, with the possible exception of milk, Iraq’s largest food markets are mainly for commodity products. Packaged food demand remains low for now, and almost entirely import driven. Despite the fact that 400 companies categorized as “agriculture related” are actually registered with the Ministry of Trade, a domestic supply of modern packaged foods is almost non-existent. The major exception is a formerly licensed Pepsico, Inc. soft drink bottling plant, still operating in Baghdad.

Currently Iraq’s dependency on imports to satisfy its basic food demand is around 47%, and would reach 68% if fruit and vegetables (almost entirely domestically produced) were excluded. In particular, there is total dependency on imports of sugar, edible oil, and tea, a high level of imported wheat (69%) and rice (81%), and a surprisingly high 67% for milk. Meat imports, an estimated 24% of consumption, are also significant, but supplies are unpredictable. The once thriving poultry industry was in disarray even before the emergence of bird flu in the region. Imports represent some 41%. At an estimated 8% import dependency, supplies of red meat -- lamb, goats and sheep – appear to be more stable, and there are some exports to neighboring countries and the Gulf

**Table 2.3 Iraq: Food Dependency on Imports.**



### 2.3 IRAQ’S AGRI-FOOD PROCESSING MARKETS: DEVELOPMENT DRIVERS

In light of the significant decline in the quality of the Iraqi diet, there will probably be a rebound in protein consumption as conditions improve: Milk and dairy products such as yoghurt and soft cheese, red meat, fish, and especially poultry could easily recover to pre-embargo consumption levels and approach regional standards. Should this happen -- and it is likely -- milk, dairy products, and poultry would quickly become high volume markets with the necessary critical mass and high rates of growth which can attract new investment in these sectors. The protein rebound will be a powerful driver, taking poultry, milk and dairy, red meat and, to a lesser extent, fish consumption to new levels.

The adoption by Iraqis of a diet richer in protein will not be the only market-defining force. Demography will also play an important role in shaping and defining Iraq’s future food markets. On the positive side, a wealthier and rapidly growing population will drive consumer demand to higher levels; but it will have the simultaneous effect of dramatically increasing import dependency unless Iraq develops its own domestic food industry.

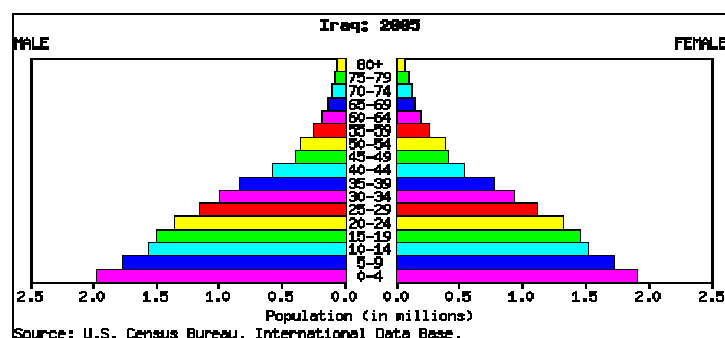
In the business of food and food production, demography is fundamental, and Iraq’s population is set to double in only twenty five years, probably reaching more than fifty million by 2040. Iraq has the highest fertility rate in the Middle East.

**Table 2.4 Iraq: Population Growth**

Population Indicators	Iraq	Iran	UAE	Turkey	Syria	Jordan	Saudi Arabia	Egypt
Population – Millions	26	68	2.5	69.6	18.4	5.7	26.4	77.5
Population growth/year.	2.7%	0.9%	1.5%	1.1%	2.3%	2.6%	2.3%	1.8%
Fertility rate	4.2	1.8	2.9	1.9	3.5	2.7	4.0	2.8
Population 2025 Millions	40.4	83.2	3.2	82.2	26.5	8.6	35.7	103.3
Population 2050 Millions	56.4	89.7	3.7	86.5	34.4	11.8	49.7	126.9

In addition to a fast growing population, Iraq also has a huge and growing percentage of young people. Consumer research conducted world wide clearly shows that the food consumption patterns of younger populations tend more toward the “westernized”, and young populations are generally more receptive to innovation. This factor could have a dramatic influence on the demand for products such as milk, dairy products in general, biscuits and snacks, and soft drinks. The same is true of such products as powdered chocolate (Nesquik, Nescau), candy, and confectionary goods, all markets where young people are traditionally heavy consumers. Although Iraq has only 26 million people, almost 10.5 million of them are age 14 and younger, two million more than the number of young people in Italy, which has a total population of 58 million.

**Table 2.5 Iraq: Population by age.**



Certainly in the medium term, there seems no question but that Iraq's demand for food will grow. The combined effect of a booming population and the return to a richer diet can only drive basic food demand even higher. In the longer term, the cost of meeting these needs with imports is likely to create a considerable economic burden unless an efficient and effective domestic food sector is established or dramatic improvements in productivity are achieved.

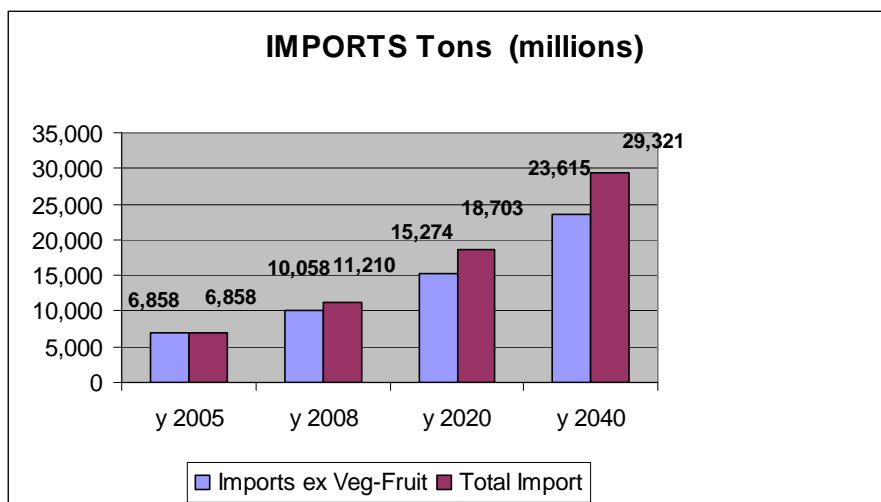
**Table 2.6 Iraq's: Estimated Basic Food Imports.**

	Present	Normalized Iraq *	Near future	Population	28,000,000	39,000,000	50,000,000
				26,000,000	Domestic Production	Import needs	Import needs
<b>IRAQ</b>	Kg/person	Kg/person	Kg/person	000 tons	000 tons	000 tons	000 tons
	<b>2005</b>	<b>2008</b>	<b>2020</b>	<b>2008</b>	<b>2008Est.</b>	<b>2020Est.</b>	<b>2040Est.</b>
Wheat	160	170	170	1,320	<b>3,440</b>	<b>5,310</b>	<b>7,180</b>
Potatoes	16	18	18	432	<b>72</b>	<b>270</b>	<b>468</b>
Rice	40	44	55	200	<b>1,032</b>	<b>1,516</b>	<b>2,550</b>
Sugar	30	35	40	0	<b>980</b>	<b>1,365</b>	<b>2,000</b>
Pulses	4	12	12	38	<b>298</b>	<b>430</b>	<b>562</b>
Vegetables	85	102	102	2,295	<b>561</b>	<b>1,683</b>	<b>2,805</b>
Fruit	87	105	105	2,349	<b>591</b>	<b>1,746</b>	<b>2,901</b>
Red meat	4.5	11	12	152	<b>156</b>	<b>277</b>	<b>448</b>
Poultry	4.5	15	20	72	<b>348</b>	<b>513</b>	<b>928</b>
Total meat	10.5	26	32	224	<b>504</b>	<b>790</b>	<b>1,376</b>
Fish	0.8	2.5	4	12	<b>58</b>	<b>86</b>	<b>188</b>
Eggs	3.9	5.5	6.5	100	<b>54</b>	<b>114</b>	<b>225</b>
Milk	55	60	75	485	<b>1,195</b>	<b>1,855</b>	<b>3,265</b>
Cheese	1.3	4	5	32	<b>80</b>	<b>124</b>	<b>218</b>
Edible oil	15	15	15	0	<b>420</b>	<b>585</b>	<b>750</b>
Other	2	3	5	4	<b>80</b>	<b>113</b>	<b>246</b>
Tea	2.2	2.2	2.2	0	<b>62</b>	<b>86</b>	<b>110</b>
Barley	40	70	80	700	<b>1,260</b>	<b>2,030</b>	<b>3,300</b>
Maize	8	25	35	90	<b>610</b>	<b>885</b>	<b>1,660</b>
<b>TOTAL</b>				<b>7,864</b>	<b>11,210</b>	<b>18,703</b>	<b>29,321</b>

\* "Normalized" Iraq = level of per capita consumption pre-embargo (began 1992).

If there is no improvement in domestic food production, Iraqi imports will probably total 11.2 million tons by 2008 and could well approach 20 million by 2005 and 30 million tons and 2040 respectively. This burden will be difficult to bear, even if Iraq does manage to reach self-sufficiency in fruit and vegetables, an area where expansion of the domestic supply seems viable and does not require significant investment.

**Table 2.7 Iraq: Basic Food Imports Needs.**



Unless there is a decline change in the fertility rate and economic collapse, import dependency, excluding fruit and vegetables, will jump from its current 68% to 76% in the short term, and could reach 88% by 2040.

**Table 2.8 Iraq: Food Dependency on Imports.**

IRAQ	y2005	y2008	y2020	y2040
Imports excluding fruits and vegetables (000 tons)	6,858	10,058	15,274	23,615
Total imports (000 tons)	6,858	11,210	18,703	29,320
Dependency on imports excluding fruits and vegetables	<b>68%</b>	<b>76%</b>	<b>83%</b>	<b>88%</b>

Aside from the fruit and vegetable sector, the lack of an efficient food processing sector in Iraq will certainly lead to an expensive import bill that is likely to absorb a considerable share of petroleum revenue, hindering the country’s ability to invest in its economy and its people. It would also be extremely costly in terms of lost potential jobs that would otherwise be created.

Taking into consideration only the most basic foodstuffs in our model to this point, Iraq imports could reach \$5 billion in 2025 and exceed \$8 billion in present-day dollars by 2040. At current world benchmark petroleum prices of \$30<sup>1</sup> a barrel, that would represent the equivalent 150 million barrels and 275 million barrels respectively. If we factor in additional market drivers, the implications are even more dramatic.

<sup>1</sup> Source: The Economist Commodity Index – December, 2005.

**Table 2.9 Iraq's: Estimated Basic Food Imports in Value**

	Imports	Imports Needs	Imports Needs	Imports Needs
	Million \$	Million \$	Million \$	Million \$
<b>IRAQ</b>	<b>2005Est.</b>	<b>2008Est.</b>	<b>2020Est.</b>	<b>2040Est.</b>
Wheat	465	533	823	1,113
Potatoes	0	0	0	0
Rice	226	265	390	655
Sugar	168	203	283	414
Pulses	25	107	155	202
Vegetables	0	0	0	0
Fruit	0	0	0	0
Red meat	13	207	368	594
Poultry	50	350	516	933
Total meat	63	557	883	1,527
Fish	18	104	153	335
Eggs	<i>n.a</i>	0	0	0
Milk	508	607	943	1,659
Cheese	6	149	232	407
Edible oil	278	289	392	505
Other	55	160	226	492
Tea	99	103	143	184
Barley	52	173	278	452
Maize	13	62	90	169
<b>TOTAL</b>	<b>1,976</b>	<b>3,302</b>	<b>4,990</b>	<b>8,116</b>

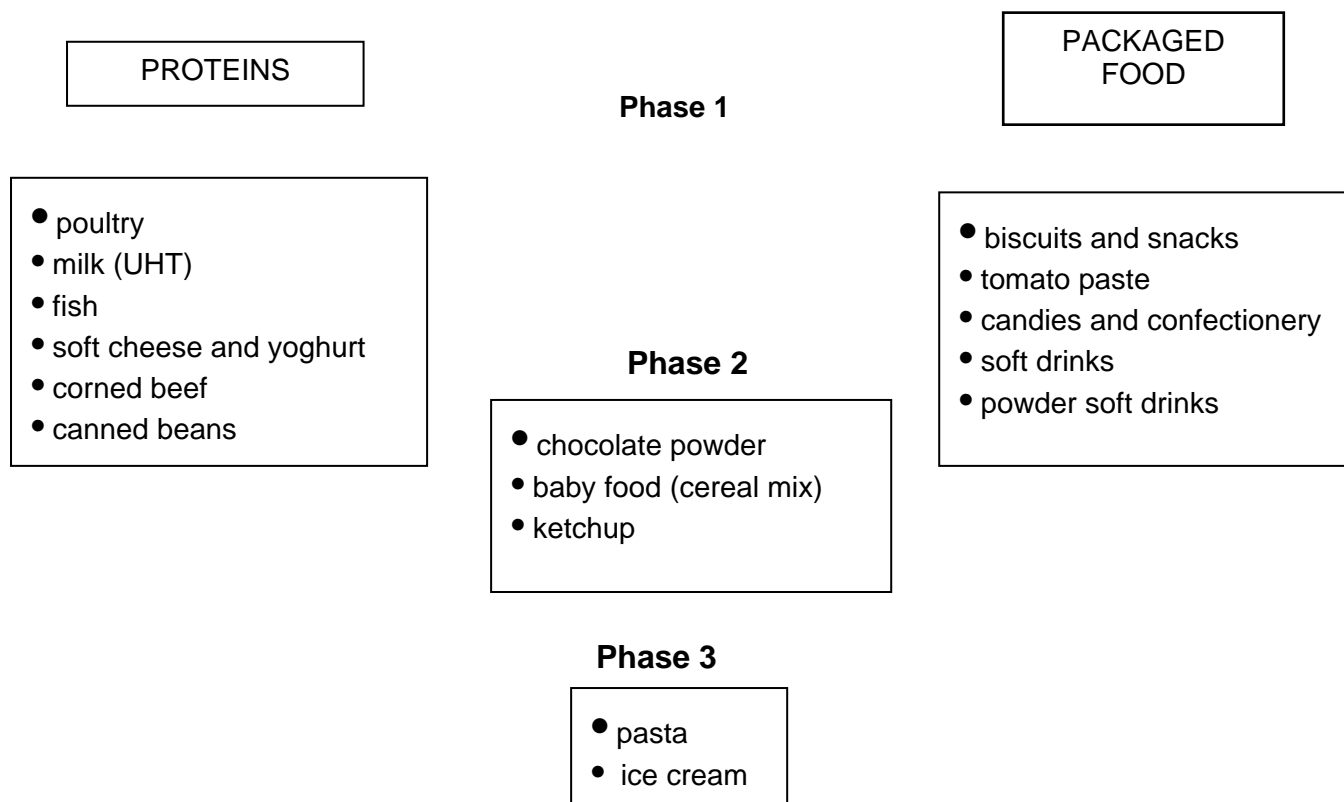
## 2.4 IRAQ'S FOOD PROCESSING MARKETS: PACKAGED FOODS

With few exceptions, demand for packaged food is currently negligible in Iraq but is very likely to accelerate. There is good reason to believe this will happen here as it has everywhere in the world where these kinds of market changes occur. Consumers will grow more sophisticated and more demanding, increased convenience and longer shelf life traditionally drive demand for these products. Indeed, food consumption patterns are remarkably similar throughout the world, especially for packaged foods, the so-called FMCG's (fast-moving consumer goods). Consumption is driven relentlessly by advertising directed toward "early adopters," usually young people, who tend to be more curious and open to innovation. At the moment only three product categories show a significant volume: Biscuit imports have reached a level of 40,000 tons or more, with an approximate value of \$30 million; tomato paste imports are about 50,000 tons, and cost \$30 million to import, and 15,000 tons of confections represent yet another \$30 million in imports.

The markets for biscuits, snacks, tomato paste and ketchup, powdered chocolate drinks, and powdered soft drinks are likely to develop quickly. Likewise the markets for candies, factory bottled soft drinks, confectionery products, basic baby foods based on powdered milk, and packaged cereals will expand as well. These are all products that have a high degree of market penetration, even in poor countries such as Peru or Bolivia, with low disposable incomes. They are easy to manufacture, easy to stock, and can be produced with a minimal investment.

Food habits in Iraq might follow a pattern of this kind:

**Chart 1**



## 2.5 IRAQ'S FOOD PROCESSING MARKETS: PRIORITIES

There is clearly potential for investment in this area and a reasonable chance of the Iraqi market providing sufficient volumes and profitability. However, while these may represent new opportunities in the world of packaged goods, action is urgently required in the large existing, basic staple food markets. Despite significant challenges and constraints, staple foods represent an opportunity with real economic significance to Iraq. There should be a vigorous program to develop a number of sectors:

1. Cereals (especially wheat), but also fruits and vegetables are in need of a thorough revolution in productivity, rather than increasing planted area. This will be especially true if exports to the GCC countries are contemplated. Competent agronomists should be retained to develop such programs.
2. Iraq's food processing plans should give priority to the poultry, milk and dairy, and edible oil industries.
3. Tomato paste, biscuits and snacks, aquaculture, sheep and goats, and possibly natural honey are among the few sectors where immediate action and immediate results are probably feasible.

In order to understand the processes involved and the bases of this analysis, we must look critically at developments and experiences in the region, especially in Turkey and Saudi Arabia. Turkey in particular should be Iraq's benchmark for processed foods (biscuits, snacks, tomato sauce). It should also become the primary source of food processing technology transfer and of potential investors. Iraq should also analyze carefully the dairy business models that have been employed in Saudi Arabia and the poultry models of Brazil.

The controversial issue of subsidies must also be addressed head on. It would be naïve to think that a new Iraqi food processing industry could compete effectively with established players already enjoying a critical mass, economies of scale, and experience with cost learning curves. Nonetheless, in light of Iraq's desire to join the WTO, care must be taken to help establish industries that, once underway, are prepared to defend their market positions in open, free-market competition.

Last but not least, the issue of the PDS market basket should be taken into consideration. It should be transformed into an engine driving early and significant demand for a modern food processing industry in Iraq. The sheer size and influence of the PDS in the market make it difficult, if not impossible, to think of totally eliminating it any time soon.

### 3. PROCESSED FOOD: PRODUCT CATEGORY

#### 3.1 CEREALS: WHEAT

Iraq's average annual per-capita wheat consumption, 160 kg is still low by regional standards and remains lower than in pre-embargo times, when it was estimated to be 170 kg. Currently at least 3 million tons per year are imported, with domestic production chronically incapable of exceeding 1.3 million tons per year. Average production between 1990 and 2002 was 1,168 million tons per year. Only in 1991 did production exceed 1.4 million tons.

**Table 3.1 Wheat: Area under Cultivation.**

<b>Wheat</b>			
<b>Year</b>	<b>Production (000 tons)</b>	<b>Yield (kg/ha)</b>	<b>Area Harvested (ha)</b>
<b>1990</b>	<b>1,195</b>	1,013	1,180,000
<b>1991</b>	<b>1,476</b>	806	1,832,000
<b>1992</b>	<b>1,006</b>	600	1,677,000
<b>1993</b>	<b>1,187</b>	590	2,013,000
<b>1994</b>	<b>1,342</b>	743	1,806,000
<b>1995</b>	<b>1,236</b>	805	1,535,000
<b>1996</b>	<b>1,300</b>	867	1,500,000
<b>1997</b>	<b>1,063</b>	757	1,405,000
<b>1998</b>	<b>1,130</b>	807	1,400,000
<b>1999</b>	<b>800</b>	615	1,300,000
<b>2000</b>	<b>384</b>	320	1,200,000
<b>2001</b>	<b>900</b>	738	1,220,000
<b>2002</b>	<b>1,000</b>	741	1,350,000
<b>Avg. 90-2002</b>	<b>1,168</b>	<b>783</b>	<b>1,618,167</b>

Yields have remained consistent at around 7-800 kg/ha an extremely low value compared with other countries in the region.

**Table 3.2 Wheat: Middle East Average Yields**

<b>Wheat</b>	<b>Iraq</b>	<b>Iran</b>	<b>Syria</b>	<b>Turkey</b>	<b>Jordan</b>	<b>Saudi Arabia</b>
Yield kg/ha	800	1,774	2,343	1,840	1,479	4,472
<b>Index</b>	<b>100</b>	<b>222</b>	<b>293</b>	<b>230</b>	<b>185</b>	<b>559</b>

To substantially improve current wheat yields may prove difficult in the short term, as Iraq's irrigation infrastructure has fallen into disrepair and, more critically, soil salinity problems are reported to have affected almost one third of the irrigated areas in central and southern Iraq. According to agronomists, the process of rehabilitation may well take many years. In the non-irrigated areas of Iraq, where production depends on rainfall, yields are at a level usually associated with sub-Saharan locales – an average of 550 kg/ha.

Claims that Iraq -- the historic Fertile Crescent -- could turn itself once again into the breadbasket of the Middle East seem largely unfounded and are probably misleading. The experience of Saudi Arabia in this respect is instructive.

In the 1970's and '80's, the Saudi government, in a bid to achieve self sufficiency in basic grains, invested heavily in crop improvement, providing indirect support through irrigation and drainage programs, and subsidizing wheat and barley production. The government eventually reduced an astronomic and totally illogical subsidy of \$933 per metric ton in 1981 to \$ 267 in 2004. This it at best a questionable policy for a commodity that trades in world markets at about \$197, and there is no obvious reason why Iraq should repeat the experiment.

Iraq's realistic objective of sustaining rural employment and achieving a certain degree of self-sufficiency in food could include establishing a target of stable production at around 2 million tons/year through higher productivity, rather than increasing the area under cultivation.

While the Saudi experience seems proof enough of the fact that Iraq will never be able to compete with imported wheat from countries where yields frequently average 6-8 tons/ha, a team of agronomists such as those at Icarda in Amman could help bring about the necessary revolution in productivity on an urgent basis. Doubling yields in Iraq, an ambitious but realistic goal, would mean production of 3 million tons per year, and would represent 35% self sufficiency over the long term.

**Table 3.3 Wheat: Projected Self - Sufficiency**

	WHEAT (000 tons)			
	2005	2008	2020	2040
Total demand	4,320	4,760	6,630	8,490
Domestic supply with high yield	1,320	3,000	3,000	3,000
Self-sufficiency	<b>31%</b>	<b>63%</b>	<b>45%</b>	<b>35%</b>

In the medium and longer terms, pasta manufacturing could generate added value for the wheat crop, but that will take time. Pasta is a product that still has low market penetration in Iraq, perhaps less than 30%. It is hardly consumed in rural areas, and even in urban areas consumption remains low, probably around 4-5 kg per capita per year. However, the investment required for pasta manufacturing is around \$15 million, and there is no low capacity manufacturing line available in the market.

### 3.2 CEREALS: PADDY RICE

Iraq's degree of self-sufficiency in rice is even lower than that of wheat --19% vs. 31% -- despite average per capita consumption of only 40 kg/year per person, and that is 10% lower than the pre-war figure of 44 kg/year.

**Table 3.4 Paddy rice: Iraq's area under cultivation.**

RICE			
Year	Production (000 tons)	Yield (kg/ha)	Area Harvested (ha)
1990	229	2,899	79,000
1991	189	2,198	86,000
1992	180	1,895	95,000
1993	206	1,873	110,000
1994	383	2,350	163,000
1995	315	1,800	175,000
1996	270	2,250	120,000
1997	244	2,017	121,000
1998	300	2,344	128,000
1999	180	1,385	130,000
2000	60	600	100,000
2001	128	1,280	100,000
2002	90	900	100,000
Avg. 90-2002	231	1,982	125,583

Rice consumption is likely to grow significantly over the short term to 50-55 kg per capita, thereby putting additional strain on Iraq's current production of around 200,000 – 250,000 tons. As is the case with wheat, yields are low, averaging less than 2 tons/ha.

**Table 3.5 Paddy Rice: Middle East Average Yields**

Rice	Iraq	Iran	Syria	Turkey	Saudi Arabia
Yield kg/ha	1,982	3,490	2,343	3,890	3,205
Index	100	176	118	196	162

Nevertheless, an increase in the area cultivated would be more advisable for rice than for wheat, taking into account relative prices and yields. Furthermore, Iraq's agricultural output is currently skewed toward winter crops (wheat and barley), with a weak summer harvest of maize and rice. Increased rice cultivation would redress some of that imbalance. An analysis of the potential for a double summer crop, as in Egypt, should also be carried out. Should efforts at increasing domestic production fail, a program of segmentation could be undertaken in order to compensate for the shortcomings of Iraq's local production. Value could be added by concentrating on varieties highly prized by consumers, such as Anber rice. We estimate Iraq's current annual import requirement at almost 900,000 tons, with

domestic production currently about 200,000 tons. Also, if conditions are right -- soil type, water availability, and topography, -- rice might be produced in the same areas as wheat to help leach salt while reclaiming the soil.

**Table 3.6 Paddy Rice: Projected Self- Sufficiency and Possible Targets**

RICE IRAQ	Present	Short Term	Medium Term	Long Term
	2005	2008	2020	2040
Total demand (000 tons)	1,080	1,232	1,716	2,770
Est. imports (000 tons)	880	1,032	1,516	2,550
Domestic production (000 tons)	200	200	200	200
Current self- sufficiency	<b>19%</b>	<b>16%</b>	<b>12%</b>	<b>7%</b>
Imports (\$ Millions)	226	265	390	655
Target: Domestic production (000 tons)	200	800	800	800
Self-sufficiency	<b>19%</b>	<b>65%</b>	<b>47%</b>	<b>29%</b>

To maintain a minimal self sufficiency in rice of 30% over the long term, domestic production should reach a minimum of 800,000 tons through a combination of doubling yields and bringing an additional 200 -250,000 Ha. under cultivation.

### 3.3 CEREALS: BARLEY, MAIZE and FEED CROPS

Current imports of barely and maize are low, probably as a side-effect of low meat consumption; but they, too, are set to follow the upward trend of higher poultry and red meat consumption in Iraq. In reality, improved poultry, red meat and dairy production is tied to improved feed. Therefore, greatly increasing the production of livestock will mean greater strain on Iraq's ability to produce grain and forage.

**Table 3.7 Barley and Maize: Iraq's Current and Future Imports Needs.**

BARLEY & MAIZE NEEDS	Red Meat kg/person	Poultry kg/person	Imports Barley (000 tons)	Imports Maize (000 tons)
<b>2005</b>	4.5	4.5	380	126
<b>2008</b>	15	11	1,190	585

Should red meat and poultry consumption recover to pre-embargo levels, 1.19 million tons of barley and almost 0.6 million tons of maize would be needed. Presently, Iraq only produces 700,000 tons of barely and 100,000 tons of maize. As with wheat and rice, yields are currently low: Barley 700 kg/ha and maize 1650 kg/ha. Also, the practice of rotating crops with wheat does not seem widespread, contrary to what is normally done in Central Asia, for example.

The value of barley and maize imports will rise drastically from the current \$65 million in tandem with meat consumption in Iraq. Over the medium term they will no longer be negligible.

**Table 3.8 Barley and Maize: Iraq's Current and Future Imports Needs by Volume and Value**

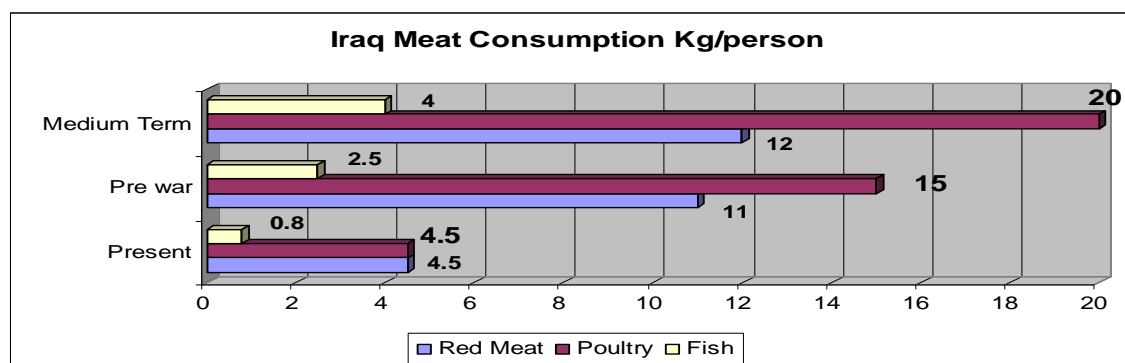
	Present	Short Term	Medium Term	Long Term
	2005	2008	2020	2040
	Import Needs(000 tons)			
<b>Barley</b>	380	1,260	2,030	3,300
<b>Maize</b>	126	610	885	1,660
	Import Value (\$ Millions)			
<b>Barley ( at 137 \$/ton)</b>	52	173	278	452
<b>Maize ( at 102 \$/ton)</b>	13	62	90	169

Alternatives to barley and corn could possibly be developed in either the edible oil sector, treated below, or by introducing new crops such as sorghum, hardly present in Iraq. In fact, sorghum has a significant advantage over corn, at least theoretically: It has the same nutritional value but is more drought tolerant and heat tolerant. It is a potential candidate for cultivation as a crop to be doubled with wheat or canola.

### 3.4 MEAT

Per capita consumption of red meat is now at 4.5 kg but should recover its pre-embargo level of 11 kg and probably stabilize at about that level. Poultry consumption could easily forge higher in the future, jumping from the current 4.5 kg to the pre-embargo level of 15 kg or even higher. A conservative figure would probably be 20 kg, but a low price as compared to red meat, convenience, and positive health perceptions might well take consumption considerably beyond that. Actual per capita consumption in Saudi Arabia is 33 kg, and in the UAE almost 50 kg. There is a trend towards higher poultry consumption throughout the region, even in places like Turkey and Egypt, where red meat consumption is still stronger.

The situation in the red meat market is somewhat different: Production of sheep and goats is reported to be stable, but meat output has been partially redirected toward exports into the GCC market, where the demand is strong and prices are higher than in Iraq.

**Table 3.9 Meat: Current and Future Per Capita Consumption**

Once again, unless a domestic industry is established -- especially for poultry -- the cost of imports necessary to cope with the growing demand will be considerable:

**Table 3.10 Meat: Current and Future Imports Needs by Volume and Value**

	Present	Short Term	Medium Term	Long Term
	2005	2008	2020	2040
	Import Needs (000 tons)			
<b>Red meat</b>	10	156	277	448
<b>Poultry</b>	50	348	513	928
	Import Value (\$ Millions)			
<b>Red meat</b> (at \$137/ton)	13	207	368	594
<b>Poultry</b> (at \$102/ton)	50	350	516	933

There are good reasons to consider poultry as a premier building block in a food processing strategy:

1. As far back as the 1970's, Iraq had a functional poultry industry, comprised of modern farms producing table eggs and broiler meat, stock farms, hatcheries, and slaughterhouses.
2. Neighboring Iran ranks fifth in world poultry production and has achieved self-sufficiency.
3. Saudi Arabia has a successful history in poultry. Its efficient, competitive domestic market produces about 500,000 tons/year, representing about 70% self-sufficiency.
4. The industry has the potential to be a powerful generator of employment in Iraq.

Nevertheless, introducing a successful poultry industry probably requires a fresh approach, and a serious consideration of new, innovative business models from other parts of the world. The Sadia and Perdigao companies, which alone account for more than 90% of the massive Brazilian chicken exports -- utilize the kind of integrated system that could be established in Iraq.

In the integrated system the mother company focuses on a few critical functions, notably all the food processing operations, from feedstuff production to hatcheries, along with slaughter and packaging. Live broilers are subcontracted to small farmers for feeding (usually in minimum batches of 5,000). They are repurchased after 47 days at a pre-set price (in Brazil) \$0.13 per bird.

In this model the mother company supplies farmers with the necessary know-how and expertise, with technology, with live broilers, and with feed; the farmers provide their labor and their coops. This integrated model minimizes the capital in circulation and allows for a high level of quality control in the manufacturing process without duplicating costs. It also

creates agricultural jobs through subcontracts to the farmers, who profit from the fees for raising the broilers and from selling manure to the market.

### 3.5 FATS and EDIBLE OIL

Developing an edible oil industry in Iraq would produce two benefits:

1. Reduce Iraq's almost total dependence on imports; and
2. Develop a domestic industry producing high-protein livestock feed from the by-products of extraction -- normally representing 40% by weight.

Current annual per capita consumption of edible oil in Iraq stands at 15 kg roughly in line with levels throughout the Middle East. Oil consumption could grow in the future as a result of substitution for ghee, perceived by middle-class Iraqis as unhealthy. Import levels are high throughout the region, except for Turkey. Iran, for example, imports 890,000 tons/year, while producing only 110,000 tons). Iraq's edible oil imports are significant and costly:

**Table 3.11 Edible Oil: Current and Future Imports Needs by Volume and Value**

	Present	Short Term	Medium Term	Long Term
	2005	2008	2020	2040
	Import Needs (000 Tons)			
<b>Edible oil</b>	390	405	570	735
	Import Value (\$ Million)			
<b>Edible oil (at \$687/ton)</b>	268	278	392	505

Currently oil seed production in Iraq is negligible. Only a few hectares of sunflowers are planted, with an average yield of 1,450 kg/ha. Iran has recently embarked on a plan to increase oil seed production, and the preliminary results are of interest:

1. Rapeseed (also called rape or colza) shows the best results. Rapeseed (both *Brassica rapa* and *Brassica napus*) can be planted in winter or spring, but winter planting showed much higher yields: 5-6 tons/ha vs. only 2 tons for spring planting. Among the available hybrids for winter planting superior performance was obtained from: Okapi, Orient, SLM-046, Licord, and Fornax. Among the types for spring the most successful were: Hayola 401, Hayola 308, and OPV Option 500" (Icarda oilseed of CWANA). In addition, rapeseed, also known as canola, is a suitable feed for livestock and poultry because of its high protein content.
2. Sunflower may be affected by salinity problems and has higher water requirements than rapeseed, despite its ability to withstand short periods of dry conditions. The sunflower seed produces over 40% by weight of edible oil, almost as much as canola.
3. Safflower (*Carthamus tinctorius*) is more drought tolerant and has higher salt tolerance than rapeseed or sunflower, but has a lower yield (<4 tons/ha) and lower oil content -- 30-35% at best. It might be considered for planting in some areas where the quality of the land is marginal.

Both canola and sunflower work well as a rotation crop with corn, soybeans, and sorghum, and also as a double crop after wheat has been harvested. Normally, both canola and sunflower are highly resistant to disease.

Iraq should analyze the potential of rapeseed, sunflower, and safflower while soy would seem inappropriate for the local soil. This should be done urgently. On the manufacturing side, Turkey has state of the art technology for both mechanical and solvent oil extraction.

### **3.6 MILK and DAIRY**

There are many good reasons to rank the development of a milk and dairy industry in Iraq as a high priority, perhaps even the first priority:

1. Good quality milk is essential in a balanced diet, especially in a country like Iraq, with its huge young population and high fertility rate;
2. Milk and dairy is traditionally a pillar of the processed food industry everywhere in the world, regardless of disposable income and population;
3. Growing population and high birth rates will have a direct and unquestionable impact on demand;
4. The market size for milk and milk derivatives in Iraq is conservatively estimated at a 1.5 billion liters for cow's milk alone, excluding yoghurt and cheese production;
5. Potentially explosive medium term market growth, resulting from an increase in milk consumption from the current low level of 55 liters per capita per year, and from growth in cheese and yoghurt consumption, presently very low due to poor supply in terms of both quality and variety;
6. In a country like Iraq, with no functioning cold chain, a supply of long life (UHT) milk is needed and highly desirable.

Presently, we estimate a market of 1.5 billion liters of cow's milk and production of approximately 400,000 to 450,000 liters. Imports cover the gap, primarily powdered milk from New Zealand, the price of which we will use to calculate market value and the value of imports, adopting the conventional conversion ratio from powder to reconstituted liquid milk.

Current annual per capita milk consumption in Iraq is lower than the pre-embargo level of 60 liters, and much lower than the regional average of 75 Liters. In Iran, for example, the government five year plan aims to achieve average per capita consumption of 163 liters by 2009 (milk plus yoghurt). In both Turkey and the Gulf Cooperation Council countries consumption is close to 100 liters. Therefore, we assume that Iraqi consumption is set to rise dramatically, and that long-term milk imports could equal the aggregate value of meat and cereals (wheat and rice), a staggering \$1.6 billion.

**Table 3.12 Milk: Current and Future Imports Needs in Volume and Value**

IRAQ	Present	Short Term	Medium Term	Long Term
	2005	2008	2020	2040
	Import Needs (000 tons)			
<b>Cow's milk</b>	1,000	1,195	1,855	3,265
	Import Value (\$ Millions)			
<b>Cow's milk</b> (as powder \$2033/ton) <sup>2</sup>	508	607	943	1659

In the medium to long term, pushed by derivatives such as cheese and yoghurt, and following trends in the region, the quantity of milk required in Iraq could as much as double. In Turkey, for example, almost 60% of milk production is processed into yoghurt or soft cheese.

Neighboring Iran has some 25 dairy processing plants, half of which are state-owned. The remainder are fully private, generally younger and more modern, process almost 50% of Iranian milk production, or some 6.3 million tons/year, into yoghurt, feta cheese, butter, powdered milk, and ice cream.

Again the example of integrated farms in Saudi Arabia is instructive. The Saudis have achieved near self-sufficiency in dairy products -- a claimed 81% -- thanks to massive investment and the use of highly integrated, intensive farms.

The current average lactation rate in Iraq is only 10 liters/day, and the country lacks strong geographic clusters in the area of milk production. Hence, there is much need for improvement. Very large, vertically integrated farms could provide a viable business model for southern and central Iraq. In Kurdistan and the north, a more traditional decentralized model, based on a fragmented, outsourced milk supply would be viable. Because the milk industry is traditionally regional due to logistics and high transportation costs, there will probably be a need -- and a sufficiently large market -- for 3 or 4 major regional players in Iraq.

Continuing with the Saudi model, there is the example of the al - Safi dairy farm, with its 29,000 head of Holsteins and Friesians, producing 600,000 liters of milk/day. It claims to be the largest integrated dairy farm in the world, and might well be a suitable benchmark for Iraq, but al-Safi it is not the only success story in Saudi Arabia: al - Marai, Nadec and Sadafco are all strong forces in the market.

The Saudi government is supportive of the dairy industry, but subsidies were never as high as they were for wheat, and a gradual program to eliminate them is under way, confirming the competitiveness and efficiency of the industry. Presently, government subsidies include: 30% of the total cost of dairy farm equipment, full coverage of all shipping costs, including air freight, for cows in herds of 50 or more, and a 50% subsidy on the official price of irrigation engines and pumps. In addition, dairy farms get subsidized feed supplied by the Grain Silos & Flour Mills Organization (GSFMS). In any case, customs duties on imported dairy products were cut from 20% to 5% in 2002. Because of its costly technology-- requiring an

<sup>2</sup> All cow's milk imports calculated as one part powdered product corresponds to six parts imported liquid product.

investment approaching \$30 million dollars -- powdered milk is also imported into Saudi Arabia: It is generally manufactured only in very large markets.

### **3.7 AQUACULTURE and SMALL RUMINANTS**

#### AQUACULTURE

Despite the almost complete disappearance of Iraq's marshes due to river diversion and draining, (the UN estimates 7,000 square miles, or 93% of the original surface), and notwithstanding the current low consumption of fish (0.8 kg/year per capita), aquaculture should undoubtedly be included in a food processing plan for four sound reasons:

1. It is certainly viable in Iraq both in the Tigris-Euphrates riverine system and in Iraq's abundant ponds and natural lakes.
2. It can provide a badly needed source of protein in the country in the short term, and can do it in a short time.
3. It has a positive, high potential impact on rural employment.
4. It is compatible with a vast range of investment starting from the level of micro-finance to larger investments, depending on the production technology: Extensive; semi-intensive; or intensive.

In Iraq there appears to be immediate potential for semi-intensive earthen pond culture. Salinity and water temperatures will eventually dictate the type of species to be cultured in Iraq. For moderate salinity (up to 5 ppm) tilapia and carp are the most obvious choices; where higher salinity is encountered, Mugil capito, Gray Mullet and Red tilapia might be preferred. Production ranges from 6,500 to 10,800 kg/ha with two catches a year. The only severe constraint seems to be tilapia intolerance of low temperature; it can not withstand sustained water temperatures below 12°C.

In the 1980's there were reportedly some 2,000 fish farms in Iraq but now, apparently, there are only 500 or so, operating with rudimentary technology and no facilities for preserving the catch or transporting it efficiently to market.

At present, carp is the only species farmed in Iraq, but based on preliminary research there are no insurmountable constraints on the development of a modern and technologically advanced aquaculture industry. There also seems to be potential for more palatable varieties of fish than carp, such as Tilapia, and perhaps for shrimp in the Basrah region. As well, there may be reasonably good potential for more up-market species such as Barbo Argenteus, although in limited quantities.

In theory, many different business models could be applied to aquaculture in Iraq, ranging from small semi-intensive fish farming to intensive fish farms and even processing activities. Although the market supports a premium for live fish, there are markets for filets, and cooperatives could provide such services as hatching, fingerlings, feed supply or production, refrigerated storage, and transportation.

The investment required to start a modern and efficient Grass Carp farming operation -- assuming an earthen pond of 1 ha. -- is approximately \$27,000, but only \$11,000 if a suitable pond is already available. At higher levels of intervention, and with a greater

investment, intensive aquaculture methods include tank culture and cage culture. Intensive production ranges from 18,500 to 25,000 kg/ha/cycle (10,000 to 12,000 kg/ha/cycle in semi-intensive operations).

### SMALL RUMINANT ANIMALS

There may also be potential in today's Iraq for a more efficient, more modern, market-oriented industry breeding sheep and perhaps goats. There is good evidence that the stock of small ruminants in the country has not decreased in the last decade despite a drastic reduction of meat consumption due to declining purchasing power. Nevertheless, the preference for lamb over fish and beef remains strong, and prices are somewhat inelastic. There is considerable anecdotal evidence of regular but unrecorded exports of live animals to the Gulf states where demand is high and increasing, with average per capita consumption currently at 7kg. A cursory analysis of the current supply/value chain clearly shows the immediate potential here:

1. There is currently unmet export demand but a relatively inelastic supply, due in part to a lack of working capital (usually 5-6 months).
2. There seems to be real potential to increase supply dramatically through the selection of improved animal varieties, more balanced feedstuff, and veterinary services. The ADG (average daily weight gain) is 200 g, suggesting the possibility of immediate positive potential for expanding the entire industry value chain and increasing profitability for farmers.
3. The only existing barrier to entry seems to be capital required because of the relatively long growth cycle. The required know-how for increased productivity is widely available and there are no apparent constraints to immediate application. The numbers of raised heads and shepherd-farmers in the market could be increased in the short term, with a potential immediate impact on selected regional economies.
4. There is also strong demand and export potential for byproducts such as crust leather to Italy, the premier sheep and goat leather processor, where raw material is in short supply.

Similar to what has been observed with respect to aquaculture, micro-finance opportunities to provide the indispensable working capital would seem a good fit and a suitable mechanism to overcome the major constraint to market entry and potential growth.

### **3.8 NEW PACKAGED FOOD: BISCUITS & SNACKS, CONFECTIONERY and TOMATO PASTE**

Biscuits and tomato paste represent strong markets in most of the world, including poor countries like Peru, Bolivia, Tajikistan and Afghanistan. Iraq's large and growing young population creates an opportunity for quick product acceptance.

#### BISCUITS & SNACKS, CONFECTIONERY

All over the world youngsters between the ages of 6 and 15 are the core consumers, tending to be highly sensitive to advertising, to product innovation, and to new flavors and products.

In South America, for example, consumption is already at 4 kg per person and growing fast. In East Asia, the Middle East and North Africa consumption is already at 2 kg per person, despite the fact that these products were only recently introduced to them.

Iraq's biscuit market can be estimated conservatively at 40-50,000 tons/year, but has the potential to double in a just a few years, assuming a beginning penetration of 60%. Filled biscuits (such as Oreos) and wafers would have the broadest appeal in the early stages, but there could also be room for butter cookies in light of Iraq's huge tea consumption. Presently the only products in the market are the 40,000 tons of imports from Iran and Turkey.

Establishing a biscuit and snack industry has strategic significance for the food sector in Iraq because it will probably represent the cornerstone of possible line extensions into chocolate, powdered chocolate, candies, and perhaps powdered soft drinks, all markets with huge potential in any country with a young profile. Confectionery is already an incipient market in Iraq with regular imports -- mainly from Turkey -- of 15,000 tons per year with a value of some \$30 million. Foreign investors for these opportunities should be targeted in Turkey, where the industry is well established but saturated, and the technology and know-how are available.

### TOMATO PASTE

Tomato paste should also be a priority in Iraq's food processing plans. There is already a large market, filled presently by low quality home-made product or by imports from Iran. Some 50,000 tons were imported in 2004 at a cost of \$30 million. Tomato paste derives from tomato concentrated at 25-28 Brix, roughly 1 kg of paste for every 7 – 8 kg of fresh tomatoes, depending on the variety. There could easily be an immediate potential for 50-60,000 tons/year, assuming a predominantly urban market in the earlier stages, while the rural population would be slower to abandon home-made product.

The minimum commercially viable production line capacity for both biscuits and tomato paste should probably have a capacity of five tons per hour. A tomato paste plant can also be switched easily to ketchup production, a market that might grow quickly in light of Iraq's young population. The necessary investment for either biscuits or tomato paste is between \$1.8 and \$2.0 million.

## 4. EXPORT OR DOMESTIC MARKETS

An export-led strategy seems neither viable nor desirable for Iraq. First, Iraq's only current agricultural surpluses are in dates and, perhaps fruit and vegetables, markets hardly characterized by high added value. More importantly, Iraq will always face formidable competitors in neighboring Turkey and Iran: Each can present a notably successful case history in food exporting. In light of the foregoing the short term potential for Iraqi exports seems questionable and limited at best.

### 4.1 THE DATES OPPORTUNITY

The opportunity for date exports is far from clear, even assuming Iraq could regain its competitiveness in the sector:

1. After the sanctions that followed the Iraqi invasion of Kuwait, Iraq lost almost all of its export markets: In 1991, only 20,000 tons were exported, compared to 240,000 tons in 1989. Other competitors, notably Iran, emerged, and rebounds are rare in highly competitive export markets. Usually the contrary occurs. Lost market share is almost never recovered.
2. Iran is a formidable competitor, not only in dates, but in most of the dried fruit markets.
3. Europe, the biggest importer of dates by value, is well supplied by Algeria and Tunisia, both of which have made enormous investments in marketing to the EU. Furthermore, European consumers have a preference for the *Deglet Nour*, a date variety not common in Iraq
4. Currently EU date imports amount to \$125 million – some 62,000 tons – with Tunisia the lead supplier (49%), followed by Israel (21.9%) and Algeria (11.7%).
5. The UAE, as a regional importer and reseller at the upper end of the value chain dominates the value added processing segment of the date market. The UAE currently imports 220,000 tons per year, almost as much as the world's largest importer, India (280,000 tons per year). In both markets the price is a very low average \$0,15/kg).
6. The US, where Iraqi dates enjoy duty free status is itself a major producer of dates. Historically imports less than 5,000 tons per year, and is itself a producer.

There may be an opportunity for Iraq to export directly to India, but its significance is reflected more in volume than in value.

In summary, the export potential for dates appears not only to be uncertain but also to be small, probably no more than \$20 million per annum. This pales in comparison to the aggregate amount of yearly Iraqi imports of edible oil (\$289 million), milk (\$607 million), and poultry (\$350 million). Together they account for more than fifty times the apparent potential for date exports.

## 4.2 THE FRUIT & VEGETABLE OPPORTUNITY

All of the countries in the immediate region of Iraq except Saudi Arabia and the UAE are self-sufficient in fruit and vegetables, and are generally exporters themselves. Realistically speaking, the states of the Gulf Cooperation Council would be the only market for Iraqi fruits and vegetables.

**Table 4.1 Fruit & Vegetables: GCC Import Potential and Self Sufficiency**

<b>Fruit &amp; Vegetable Markets (tons)</b>			
<b>Saudi Arabia</b>	Total Market	Self-sufficiency	Imports
Fruit	1,970,000	66%	670,000
Vegetables	2,500,000	88%	200,000

<b>Fruit &amp; Vegetable Markets (tons)</b>			
<b>GCC-5</b>	Total Market	Self-sufficiency	Imports
Fruit	895,455	28%	644,727
Vegetables	1,086,957	35%	706,522

The GCC is a large regional importer of fresh fruit and vegetables and has no more land available to increase production, so new demand must be satisfied by additional imports. In the 2003 GCC imports of fruit and vegetables amounted to almost \$ 1.7 billion.

Competition in the regional fruit and vegetable market is keen: India has recently signed a bilateral agreement with the GCC that could eventually lead to a free-trade pact; and Syria has a free-zone trade agreement with the GCC. While a restored, more efficient horticultural sector in Iraq could certainly obtain a share of the GCC market, the competitors are numerous, and achieving a dominant market position is unlikely.

**Table 4.2 GCC: Fruit & Vegetables Imports, 2003 by Country of Origin\***

HS	Importing Country	\$ millions	Country Origin							
			Jordan	India	Iran	China	Lebanon	Syria	Saudi Arabia	Pakistan
07	UAE	270,817								
			57,713	31,395	24,903	19,603	13,190	12,086	17,934	8,957
07	Saudi Arabia									
			Syria	Egypt	Turkey	China	Yemen			
			54,335	20,359	14,583	10,646	10,604			
07	Kuwait	98,793								
			Jordan	Syria	India	Egypt	Iran	Lebanon		
			22,357	11,645	10,267	8,928	8,295			
07	Qatar	30,936								
			India	Syria	Iran	Saudi Arabia				
			4,826	4,266	2,633	3,958				
07	Bahrain	41,886								
			Saudi Arabia	India	Jordan	Syria	Egypt			
			10,018	8,627	6,298	2,723	2,490			
07	Oman	32,175								
			UAE	Syria	Saudi Arabia					
			12,996	5,113	2,041					
07	Yemen	14,291								
			China							
			6,064							
07	<b>Total Vegetables</b>	<b>650,967</b>								
08	Saudi Arabia	352,805								
			Egypt	South Africa.	Syria	Philip.	Iran	Yemen	India	
			61,323	45,761	29,308	29,196	19,594	17,675	16,761	
08	UAE	420,138								
			Iran	USA	India	South Africa.	Philip.	Pakistan	Egypt	
			130,881	51,057	36,687	26,777	25,480	17,110	13,860	
			Turkey	Chile	Lebanon					
			12,462	11,415	11,204					
08	Kuwait	115,278								
			Lebanon	Iran	India	Syria	Philip.	Egypt		
			17,064	16,721	11,869	10,829	9,743	7,904		
08	Bahrain	56,631								
			Lebanon	Syria	Philip.	Iran	India			
			10,429	8,365	6,084	4,766	3,644			
08	Qatar	31,192								
			Syria	Philip.	Iran					
			5,919	5,120	3,272					
08	Oman	42,800								
			UAE	Syria	Egypt	India				
			20,619	5,905	4,152	2,351				
08	Yemen	21,971								
			Saudi Arabia	UAE						
			14,956	3,974						
08	<b>Total Fruit</b>	<b>1,040,815</b>								

\*The International Trade Center Harmonized Code classification 07 includes edible vegetables and certain roots and tubers. Classification 08 includes edible fruits and nuts, and the peels of citrus fruits and melons.

### **4.3 NATURAL HONEY OPPORTUNITY**

The potential for possible Iraqi exports of natural honey is clear from the standpoint of demand, but still requires a rigorous assessment from the supply side. The GCC countries currently import 16,000 tons of natural honey annually from countries as diverse as Yemen, Mexico, Pakistan, Argentina, Turkey, Iran and Australia at a cost of \$65 million. Their demand for natural honey has been growing at a fast average rate of 11-15% since the year 2000.

Iraq's capacity to produce honey in the quantities required should be assessed carefully to determine whether it would suffice to create a viable export industry driven by GCC imports. At the moment there are insufficient data available regarding capacity in Iraq. A capability study would probably focus on the production potential of natural honey in northern Iraq before considering any processing facilities.

## 5. INVESTOR PROFILE

No project, no matter how great the potential, can come into being without investors, and no investor can invest in the absence of reliable data and figures. Our priority must be to lay out as comprehensive a basic business plan as possible for each of the potential opportunities we have identified in the Iraqi food processing sector. Only then can one proceed to the second step of identifying potential investors.

Profit margins in the food processing sector are relatively low, but at least in western markets food processing is a low risk activity. Analysts consider it to be a relatively stable sector with few fluctuations. In western markets, agri-food businesses generally produce a return on investment (ROI) of around 12%, with the notable exception of beverages (soft drinks), where it is much higher -- around 20%. These values are typical for leading brands in various markets. (Source: *Dun and Bradstreet 2004*).

**Table 5.1 European Food Industry: average profitability indicators**

SECTORS	Operational profit	Pretax Profit	ROI
Food processing (packaged food)	<b>11-13%</b>	<b>8-10%</b>	<b>12%</b>
Commodity food processing (milled rice, cereals, horticulture, meat, fisheries, poultry).	<b>8-9%</b>	<b>5-6%</b>	<b>12%</b>
Beverages	<b>18-20%</b>	<b>12-15%</b>	<b>20%</b>

Preliminary research aimed at exploring the market suggests that foreign food processors consider investing in Iraq to be risky, and suggests that the minimum acceptable projected ROI should be at least 18% -- higher than what is likely be the case. Because Iraqi investors are particularly keen on quick returns, the usual industry time span for achieving the break-even point – let alone a positive return on investment will be viewed by them as an additional drawback. Therefore, most potential investors will probably come from the sector itself, and probably from outside Iraq, considering how small the existing food processing sector in the country actually is. So, while there is a broad spectrum of available investors in principle, in fact three profiles appear to promise a better chance of success, taking into account the characteristics of Iraq's food processing sector.

We should target initially:

1. Turkish food processing companies.
2. European and North American multinational corporations.
3. Existing Iraqi investors in the food business abroad

Turkish food companies should probably receive top priority. Processed food markets are well developed in Turkey but saturated, with heavy consolidation under way and dwindling profitability. Strong Turkish companies that are investment oriented such as Pinar Sut, Sek, which was recently acquired by the powerful Koc industrial conglomerate, Sutas, and Ulker, a diversified food company with sales of around \$2.5 billion, all operate in the areas of dairy products, biscuits, snacks, and ice cream, and should be contacted. Furthermore, Turkish

investors have valuable regional experience and are more likely to accept the challenge of investing in Iraq.

EU- based companies should not be ruled out. Many of them began investing heavily in the Middle East and North Africa in the early 1980's. They, too, know the region and its markets. All of the large European food companies, and most of the medium sized operators, already have manufacturing and sales operations in Turkey, which attracted the highest foreign direct investment (FDI) in the region in the 1980's. Since the mid-1990's, European attention has turned to Saudi Arabia and UAE, which surpassed Turkey in FDI during the period 1995-2000. The latest targeted market at present is Egypt, while Syria and Iran have been almost totally neglected.

**Table 5.2 European Food Company FDI in the Middle East: the Economist Intelligence Unit**

COUNTRY	Average 1980-1995	Share	Average 1995-2000	Share	Average 2000-2005	Share
TURKEY	\$187	<b>79%</b>	\$92	<b>26%</b>	\$42	<b>13%</b>
SAUDI ARABIA	\$18	<b>8%</b>	\$134	<b>34%</b>	\$112	<b>35%</b>
UAE	\$8	<b>3%</b>	\$103	<b>21%</b>	\$96	<b>23%</b>
IRAN	\$5	<b>2%</b>	\$5	<b>2%</b>	\$3	<b>1%</b>
EGYPT	\$13	<b>5%</b>	\$69	<b>15%</b>	\$107	<b>27%</b>
OTHERS	\$6	<b>3%</b>	\$8	<b>3%</b>	\$4	<b>1%</b>
<b>TOTAL</b>	<b>\$237</b>	<b>100%</b>	<b>\$281</b>	<b>100%</b>	<b>\$324</b>	<b>100%</b>

A stable Iraq could be well-positioned to follow Egypt as an investment priority, especially given investors' low estimation of prospects for Syria and Iran. In the dairy industry, the French Groupe Danone is a potential investor. It is an active regional investor, having recently acquired the Al-Safi Group in Saudi Arabia, and having signed a partnership with the Rachid dairy group of Egypt in 2004.

It may be some time before the current investment activity in the Egyptian market winds down and the major multinational players are prepared to move on to new opportunities. That is one reason to seek out Turkish firms first, but the process of filling a market proceeds quickly, and it is not too early to begin approaching the major European operators.

Additionally, the traditional North American food corporations (Kraft, Coca Cola, and so forth) can not be ignored. They, more than anybody, prize the unique opportunity to be the first in a market, thereby increasing their chances of achieving a dominant position, defined as a market share of greater than forty percent.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

The development of a modern food processing industry in Iraq is a realistic objective. Neighboring countries such as Saudi Arabia and Iran, let alone Turkey, have already achieved remarkable results under similar conditions. A conservative estimate is that successfully executing a reasonable strategy in the food and agriculture sector may contribute as much as \$10 billion to Iraq's GDP, assuming that Iraq can achieve levels of agricultural production per capita that are in keeping with regional levels, and can establish a food processing industry that is similar to those found in neighboring countries.

The implementation of such a strategy must not be delayed. The three drivers identified in our analysis - growing population, a diet richer in protein, and increasing demand for packaged food – are virtually inevitable. It is simply a question of when, not if, their impact will be felt, and the result will be dramatically increasing import dependency. Unless Iraq develops a domestic food industry, the result in a short period of time will be a scarcity of funds for other productive investments. The benefits of job creation in agriculture and food processing -- including rural jobs -- are over and above the matter of avoiding a considerable hemorrhage of national wealth.

An integrated national plan will require coordinating working teams with skills in four areas: Agriculture; food processing; investment promotion, and regulation of the food sector. A modern regulatory regime is an urgent priority.

There are clear opportunities and priorities to be addressed:

1. An agriculture team should lead in the following areas:
  - Improvements in productivity, especially for cereal crops, primarily wheat, but also for vegetables. The current low yields are unacceptable and do not come close to regional standards. Increases in cultivated land are ineffective with yields at their current levels.
  - A feasibility study to determine appropriate varieties of oil seeds. If successful, this strategy can result in the successful development of complete self sufficiency in edible oils, which are presently 100% imported. An added benefit will be a better supply of badly needed livestock feed.
  - Development of the aquaculture sector, an easy and quick means to develop a source of protein that allows investment at the most minimal levels and also on a small industrial scale.
  - Development of a small ruminants industry able to generate considerable export of meat to the GCC countries and possibly exports of crust leather to Italy.

2. A processed food team that integrates its work with that of the agronomists should take the lead in:
  - Developing a model for the dairy and poultry industries, considering as models such examples of successful businesses the integrated dairy farms of al-Safi in Saudi Arabia and the decentralized poultry breeding system employed in Brazil.
3. The Iraq Investment Promotion Agency (IIPA) should:
  - Promote investment by targeting companies in Turkey in the biscuit and snack, tomato paste, and dairy sectors as a top priority.
  - Develop reliable and current sectoral database and information systems as tools for increasing transparency for potential investors.
4. The appropriate officials and ministries of the Government of Iraq and their local counterparts must develop and enforce a new and modern food code and food regulation protocol. They should also promote a national debate on the best allocation of arable— especially irrigated – land.
5. Finally, the existing PDS system should be rethought and converted into an instrument to create demand for a new Iraqi food processing industry in its nascent period. The highly subsidized food basket program utilizes huge volumes of imported foods and entails great expenditures by the national treasury. Food baskets are available to all Iraqis, and their impact is sufficient to distort the market. This distortion can make it impossible for the private sector to compete in the Iraqi marketplace.