

# Faculty Paper Series

Faculty Paper 98-9

February 1998

## CAN WE FORECAST THE PRICE OF HONEY?

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**CAN WE FORECAST THE PRICE OF HONEY?<sup>1</sup>**  
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**Abstract**

While the long term trend in U. S. production has been downward, increased imports have been supplying the upward trend in U. S. honey consumption. Exceptionally high producer level prices during 1996 and 1997 were apparently due to lower world supplies, particularly as reflected in stocks. The recent large increases in imports and, to a lesser extent, stocks led to the softening in U. S. producer prices in 1997 while retail prices and margins remained firm. U. S. retail poundage sales, based on Nielsen data, remained robust, dropping only slightly in the face of a 40% increase in retail price between 1995 and 1997.

The producer price for honey in 1998 will depend largely on three factors: (1) U. S. honey producers' response in terms of honey production, (2) the management of stocks in response to price expectations, and (3) the role of imports as part of total U. S. honey supply.

<sup>1</sup> Submitted to the *Journal of the Texas Beekeepers Association*, April/May 1998

## **CAN WE FORECAST THE PRICE OF HONEY?**

by Carl E. Shafer

Yes, we can forecast the price of honey. Someone can and does forecast most everything. Unfortunately, while anyone can, and many do forecast, they frequently don't get it right. Consider the recent forecasts regarding the Southeast Asian "economic miracle", not to mention Wall Street pundits now looking for cover. But that's another story. Let's stick to honey. Forecasting the price of honey to U. S. producers would have been fairly easy for the 20 year period 1975 through 1994 by simply naively assuming that next year's price would be the same as this year's price. Forecasting next year's price from this year's price from 1975 through 1994, our average error would have been only 2.3 cents/lb. That's because the price varied between 50 and 56 cents/lb. for 14 of the 20 years. Clearly, price was generally quite stable. But those were the "good old days" when the price was close to or setting on the government support price. Those days are gone. So what? So, if you tried to forecast price for 1995, 1996 and 1997 using only the previous year's price as the forecast you would have been way off; about 16 cents too low for 1995, over 20 cents too low for 1996 and probably 15 cents or so too high for 1997. Welcome to the free market.

Thus, honey producers are now living in the world of supply and demand and freely moving prices. Let's consider the recent situation.

### **Points to Consider .....**

Presently, the federal government's support program with price supports and large, comfortable CCC carryover stocks of honey is gone. U. S. honey production has been in a long-run down trend. In contrast to U. S. production, U. S. domestic use of honey has been trending upward. Increased imports are making up the difference between domestic production and consumption. Stocks are down considerably from the CCC days. U. S. exports of honey have been small and stable at about 4% of U. S. production. Producer prices were flat at around 50 to 55 cents/lb. between 1974 and 1994 and then spiked in 1995-7, dropping in late 1997. Uncertainty in the U. S. honey market has increased several notches.

What we are currently seeing in producer level honey prices is not unlike price behavior in other agriculture commodities at the producer level. For example, during the last 10 years producer level pecan prices varied from as low as 50 cents/lb. to as high as \$1.40/lb while supply ranged from 300 to 450 million pounds. The pecan market is also subject to a significant volume of imports. Further, the March '98 Kansas City Board of Trade wheat contract price varied from \$3.30 to \$4.91 per bushel during the 12 months prior to January 1998. Cash prices varied similarly. The Chicago Board of Trade March '98 corn contract price exhibited a range of \$2.36 to \$3.05. And so on. Changes in demand and, even more importantly, supply caused these large changes in prices.

## Determinants of Honey Price

In a very elemental presentation, Figure 1 suggests the major factors which move honey prices from year to year. Production, carry-in stocks and imports make up annual total supply. Domestic consumption, exports, carry-out stocks and marketing margins make up demand at the producer level. Changes in supply are usually larger than changes in demand. Thus, supply factors are the most critical in trying to explain price behavior. Note in Figure 1 that while production is predetermined, stocks and imports both influence price and are influenced by price..... simultaneous relationships. This situation makes it difficult to forecast price because increased prices cause increased imports which, in turn, moderate prices which, in turn, reduce imports and so on. In order to isolate the effect of each variable on price requires a reasonable number of years of data. So far, honey has only been in the “free” market for a year or two. Nevertheless, let’s check some numbers in the balance table for U. S. honey.

### U. S. Domestic Situation

U. S. total honey supply (production + stocks + imports) dropped 2.1% from 1993 to 1994, then fell another **14.1%** from 1994 to 1995, leveled off in 1996 and then increased slightly in 1997, Table 1. Production decreased 14% between 1993 and 1996/97. Stocks dropped by **half** from 1993/94 to 1996/97. The significant increase in imports did not offset the combined decline in production and stocks. Thus, the 50 some million pounds drop in U. S. supply over this period helped boost producer prices. U. S. exports increased slightly (a million pounds) and consumption decreased slightly. In many commodity markets, users are particularly sensitive to stocks as a part of total supply. The apparent increase in stocks in 1997 and 1998(?) and the unprecedented response of imports to the higher prices resulted in a softening of prices during latter 1997.

Interestingly, the balance table situation for the world’s six major honey producing/consuming countries looks similar to that for the U. S., Table 2. Total supply dropped between 1993-1995 and 1996/1997. Note that the U. S. is the major stock carrier among the six countries. Recent declines in both U. S. and “world” supplies supported higher producer prices in 1996 and 1997.

Returning to domestic U. S. consumption, retail sales have been relatively firm in the face of considerably higher retail prices. As retail prices rose from \$1.78/lb in September 1995 to \$2.30 (+29 percent) in September 1996, retail sales declined from the previous year by only 3 percent according to National Honey Board Nielsen Topline survey data. Thus, the total dollar value of retail sales increased considerably. Similarly, prices ranged from \$2.27 to \$2.40 during the August 1996 to August 1997 period but sales dropped only slightly (-3%) from the previous year so that total revenue at retail increased significantly. This means that the demand for honey at retail appears to be quite inelastic (at least in the short run) so that the volume sold does not decline proportionate to price increases. This is good for honey sellers when prices rise. On the other hand, this condition may lead to disproportionate decreases in price if volume increases.

### Retail-Producer “Price Spreads”

Using the National Honey Board’s Nielsen Topline survey retail prices and the USDA’s *National Honey Market News* North Dakota producer prices, we can derive a rough “spread” between retail and producer prices for July/Sept periods for four years as follows:

July/Sept Period	North Dakota clover white -----(dollars per pound)-----	Nielsen retail price	Spread	ND price as % of retail
1994	\$ 0.50	\$1.70	\$1.20	29.4
1995	.59-67	1.75	1.16-1.08	33.7-38.3
1996	.90	2.25	1.35	40.0
1997	.72	2.38	1.66	30.2

Note that the spread dropped initially when prices rose in 1995. While the spread was definitely larger in 1997 than in 1994, the producer price is essentially the same percentage of the retail price as in 1994; i.e., 30 percent. This raises the question as to how margins are determined? There are at least three pricing points in the honey marketing channel; the producer, the first buyer (packer) and the retailer levels. Thus, there are at least two spreads, that between the producer and the packer’s selling prices and that between the packer’s and the retailer’s selling prices. If all spreads are set strictly on a percentage markup basis, then the recent margin behavior is as expected because the producer price increased by 44% between 1994 and 1997 and the retail price increased only 40%. Producer prices dropped in the second half of 1997 following their peak during late 1996 and early 1997. Retail prices and margins have been slower to decline. Producer to retail margins are typically not simple percentage mark-ups. More study is needed on margin behavior where large price changes have occurred.

### Imports and International Aspects

Again, the important factors in the recent honey situation have been; the end of the government program, the drop in domestic production and the unprecedented increase in imports in response to the 1996/7 price run-up. U. S. imports have come largely from Argentina and China. China is the world’s leading producer and exporter of honey, Table 3. China exported half of its honey while Argentina exported essentially their whole production during 1995-1997. Mexico also exported roughly half of its production. Argentina became the leading exporter to the U. S. in 1996 and, in all probability, during 1997.

U. S. imports increased to an all time high of 150.5 million pounds in 1996, Table 4, and, possibly, up to 154 million pounds in 1997. The large increase in imports between 1995 and 1996 was in response to the average import value/lb. moving from 37 cents in 1994 up to 53.1 cents in 1995 and even higher at 73.5 cents in 1996, Table 4. That is, the value of imported honey per pound essentially doubled between 1994 and 1996.

In 1996, most of China’s honey exports went to Japan (63.1 million pounds) with similar amounts going to the U. S. and Germany, 40.6 and 38.1 million pounds, respectively, Table 5. Well over half (58%) of Argentina’s exports went to the U. S. in 1996, Table 5. Preliminary

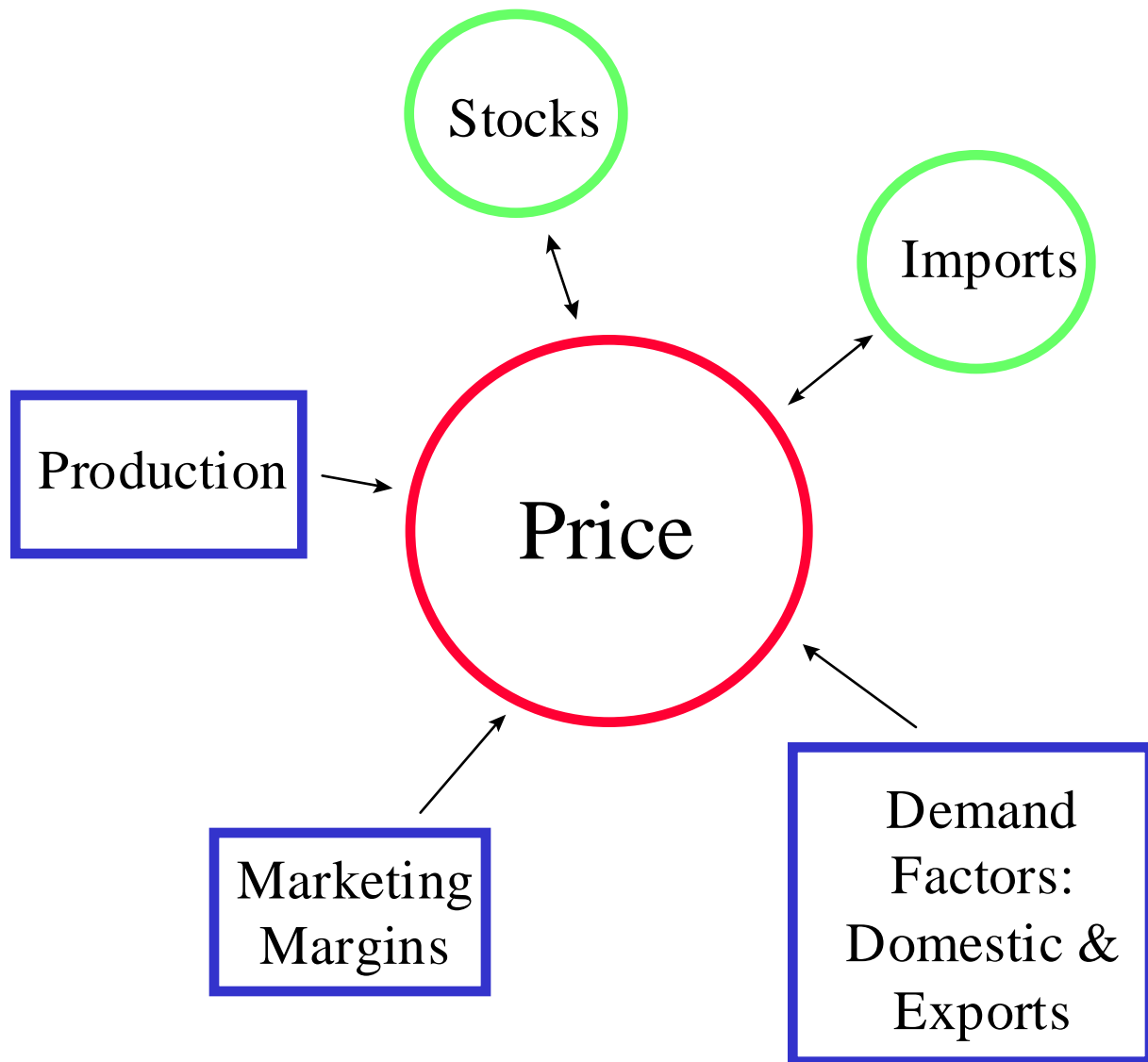
National Honey Board data indicate that 52.85% of their assessments were for imports, Table 6. Since the assessment is 1 cent/lb., the values in Table 6 easily convert to poundage so that 1997 total assessments are for 321,060,413 pounds. Imports assessments were on 169,693,292 pounds. The December assessment data are preliminary. Imports would not equal or exceed total U. S. production due to smaller producers not being assessed. Imports were expected to be about 78 percent of production in 1997, Table 1.

## **Summary**

While the long term trend in U. S. production has been downward, increased imports have been supplying the upward trend in U. S. honey consumption. Exceptionally high producer level prices during 1996 and 1997 were apparently due to lower world supplies, particularly as reflected in stocks. The recent large increases in imports and, to a lesser extent, stocks led to the softening in U. S. producer prices in 1997 while retail prices and margins remained firm. U. S. retail poundage sales, based on Nielsen data, remained robust, dropping only slightly in the face of a 40% increase in retail price between 1995 and 1997.

The producer price for honey in 1998 will depend largely on three factors: (1) U. S. honey producers' response in terms of honey production, (2) the management of stocks in response to price expectations, and (3) the role of imports as part of total U. S. honey supply. One thing, for sure, we are, as the old Chinese curse says, "living in interesting times" in the honey business.

# Figure 1. Honey Price Determinants?



- denotes predetermined relationships
- denotes simultaneous relationships

**Table 1. Honey Production, Supply, and Distribution, United States, Calendar Years 1993-1997<sup>1</sup>**

YEAR	SUPPLY				DEMAND	
	PRODUCTION	BEGINNING STOCKS	IMPORTS	TOTAL	EXPORTS	DOMESTIC CONSUMPTION
	----million pounds ----					
1993	230.6	103.5	133.6	467.7	8.5	341.9
1994	217.2	117.3	123.2	457.7	8.3	355.2
1995	210.5	94.1	88.6	393.2	9.3	341.6
1996	198.1	42.2	150.6	390.9	9.8	334.0
1997 <sup>1</sup>	198.4	47.0	154.3	399.7	9.5	337.3
1998	----	52.9	----	----	----	----

<sup>1</sup> 1997 production forecast is the first estimate based on objective survey to be released in February 1998.

Source: USDA, FAS *Sugar: World Markets and Trade* Circular Series FS 2-97, November 1997, page 46.

**Table 2. Honey Production, Supply, and Distribution Total for Argentina, Canada, China, Germany, Mexico, and U.S., Calendar Years 1993-1997<sup>1</sup>**

YEAR	SUPPLY				DEMAND	
	PRODUCTION	STOCKS	IMPORTS	TOTAL	EXPORTS	DOMESTIC CONSUMPTION
	----million pounds ----					
1993	980.4	136.1	314.8	1,431.4	468.5	816.8
1994	961.5	146.1	311.2	1,418.8	486.3	816.8
1995	1,014.0	115.7	296.9	1,426.6	466.9	863.6
1996	840.8	96.1	374.4	1,311.3	430.1	800.6
1997 <sup>1</sup>	870.8	80.6	366.4	1,317.8	395.3	825.6
1998	----	96.9	----	----	----	----

<sup>1</sup> Data for 1997 are forecasts. U.S. production data available in February 1998.

Source: USDA, FAS *sugar: World Markets and Trade*, Circular Series FS 2-97, November 1997



**Table 3. Honey: Production and Exports, Selected Countries**

COUNTRY	1995		1996		1997 <sup>1</sup>	
	production	exports	production	exports	production	export
	---- million pounds ----					
Argentina	154.3	140.0	125.6	118.1	143.3	136.7
Canada	67.4	34.3	54.8	21.9	64.0	17.6
China	392.4	191.8	324.1	184.0	330.7	143.3
Germany <sup>2</sup>	80.8	(163.7)	32.4	(158.2)	33.1	(163.1)
Mexico	108.5	56.4	105.8	60.5	101.4	52.9
Subtotal	803.4	---	642.7	---	672.5	---
U.S.	210.4	9.3	198.1	9.9	198.4	9.5
Total	1013.8	---	840.8	---	870.9	---

<sup>1</sup> Preliminary<sup>2</sup> Net imports in parenthesesSource: USDA, FAS *Sugar: World Markets and Trade Circular Series FS 2-97*, November 1997

**Table 4. U.S. Honey Imports, Calendar Years 1994-1996**

COUNTRY	1994	1995	1996
	----million pounds ----		
China	64.7	27.5	42.8
Argentina	40.3	27.6	68.3
Canada	10.2	26.5	17.6
Mexico	5.3	5.6	12.1
Australia	1.3	0.1	2.9
Dom. Republic	0.3	0.3	0.2
Germany	0.2	0.2	0.3
Hong Kong	0.2	--	--
New Zealand	0.1	0.2	0.3
Other	0.5	0.6	6.0
Total (million lbs.)	123.1	88.6	150.5
Total (million \$)	45.6	47.0	110.7
Import Value/lb. (¢)	37.0	53.1	73.5

Source: USDA, FAS *Sugar: World Markets and Trade Circular Series FS 2-97*, November 1997

**Table 5. Argentine and Chinese Exports to Selected Countries, 1996**

COUNTRY	ARGENTINA	CHINA
	---- million pounds ----	
U.S.	68.2	40.6
Germany	27.5	38.1
Canada	3.9	6.6
Japan	2.7	63.1
United Kingdom	--	17.6
Other	15.7	17.8
<b>TOTAL</b>	<b>118.0</b>	<b>183.8</b>

Source: U.S. Attache Report FAS/USDA

**Table 6. NHB Domestic vs. Import Assessments, Annual 1991-1997**

YEAR	TOTAL ASSESSMENTS	% IMPORTS
1991	\$2,892,440.00	30.40
1992	\$3,086,292.91	36.28
1993	\$3,421,297.02	37.81
1994	\$2,865,747.99	43.65
1995	\$2,861,032.44	30.54
1996	\$3,144,641.77	47.17
1997 <sup>1</sup>	\$3,210,604.13	52.85

<sup>1</sup> December figures preliminary

Source: National Honey Board, Assessment Data