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Trade Performance of Natural Honey in India - A Markov Approach

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ABSTRACT
Honey is a natural product which is defined as a sweet liquid prepared by honey bees from nectars of plants. India has been known as 'land of honey'. The present study was undertaken to analyze the pattern of export, import and balance of trade of natural honey in India by tabular analysis. The results revealed that the export performance of natural honey showed increasing trend whereas the imports of natural honey showed up and down trend for past ten years. The study was also undertaken to find out the direction of trade of natural honey from 2007-08 to 2012-13 using Markov Chain Analysis which revealed that India's previous natural honey export to the USA market was retained to the level of 34 per cent and remaining 66 per cent was diverted to other countries category. India's previous natural honey export to the Yemen Republic market was retained to the level of 45 per cent and remaining 55 per cent was diverted to USA alone. India could not retain its previous import of natural honey to China and Australia. India's previous natural honey import from the Malaysia market was retained to the level of 7.3 per cent and remaining 92.7 per cent was diverted to China (85.5 %) and other countries (7.2 %). Indian honey offers tremendous export potential. For tapping its potential, there is need to chalk out suitable export strategy. Some of the points are application of advanced technology for collection, and processing of honey, adhering strictly to the quality standards, recognition of bee keeping as agro-industry and developing an efficient export marketing network to optimize the production and exports. Timely implementation of the above steps coupled with the special package of assistance announced recently by the Commerce Minister while announcing the new foreign trade policy for export of minor forest products including honey is likely to pave the way for a quantum jump in the export of honey from the country in the coming years.
Keywords: India, Trade, Natural Honey, Markov Chain

INTRODUCTION

Global trade in livestock products is expanding rapidly and significantly due to increase in consumer demands linked to growing educational and awareness of consumer, internationalisation of tastes and habits, developments in science and technology and improvements in communication and transportation. Honey is a natural product that has no substitute. It is defined as a sweet liquid prepared by honey bees from nectars of plants. India has been known as 'land of honey'. Since centuries, honey is used to treat a variety of ailments through a wide range of applications [4]. Despite the simplicity of technology and its tremendous advantages as well as its potential of providing employment, honey production has not realized its full potential. About sixteen lakh people are directly or indirectly engaged in the bee keeping and allied activities. Major honey producing states in the country include Punjab, Haryana, Himachal Pradesh, UP, Bihar and West Bengal. Keeping these points in mind, the present study was conducted to assess the trade direction and changing pattern of natural honey trade in India.

MATERIALS AND METHODS

The data used in this study were collected from various secondary sources. Time series data for twenty year (1991 – 2011) on export and imports (quantity as well as in value terms) of natural honey for the world and India were collected from Food and Agricultural Organization of the United Nations, FAO trade statistics and FAO commodity Review and outlook [3]. The data on top exporting and importing countries were collected from Agricultural and Processed food products Export Development Authority (APEDA), Ministry of Commerce and Industry, Government of India [1].

Tabular analysis

To find the trend in export and import of natural honey in India

Markov Chain Analysis – Transitional Probability Matrix

For finding out the changes in the structure of the trade in natural honey of India, Markov chain analysis was used. Markov analysis is an application of dynamic programming to the solution of a stochastic decision process that can be described by a finite number of states [2]. A finite markov process is a stochastic process whereby the outcome of a given trial t (t = 1, 2... T) depends only on the outcome of the preceding trial (t-1) and this dependence is the same at all stages in the sequence of trials. Central to Markov chain analysis is the estimation of the transitional probability matrix P. The element P_{ij}, of this matrix indicates the probability that export will switch from category i to category j with the passage of time. The diagonal element P_{ii} measures the probability that the export share of ith country will be retained [5, 6].

RESULTS AND DISCUSSION

TRADE PERFORMANCE OF NATURAL HONEY IN INDIA

Honey and beekeeping have a long history in India. Honey was the first sweet food tasted by the ancient Indian inhabiting rock shelters and forests. Honey is a rich source of carbohydrates, recommended by many dieticians to provide one's muscles with the stimulant of energy that they require. India, due to its biodiversity produces approx. 65000 MT per year. India is becoming an increasingly important supplier of high quality, mild honey with versatility for the North American market.

Table: 1 Trend in Export and Import of Natural Honey in India

	Export	Import	Net trade
1991	0	0	0
1992	1	3	-2
1993	166	3	163
1994	120	162	-42
1995	521	185	336
1996	581	80	501
1997	752	0	752
1998	1609	23	1586
1999	1921	27	1894
2000	1534	1163	371
2001	3210	1098	2112
2002	6647	3387	3260
2003	6964	155	6809
2004	10354	2605	7749
2005	16769	502	16267
2006	8136	1008	7128
2007	12231	2529	9702
2008	15588	2800	12788
2009	13311	1104	12207
2010	22649	2405	20244
2011	28940	859	28081
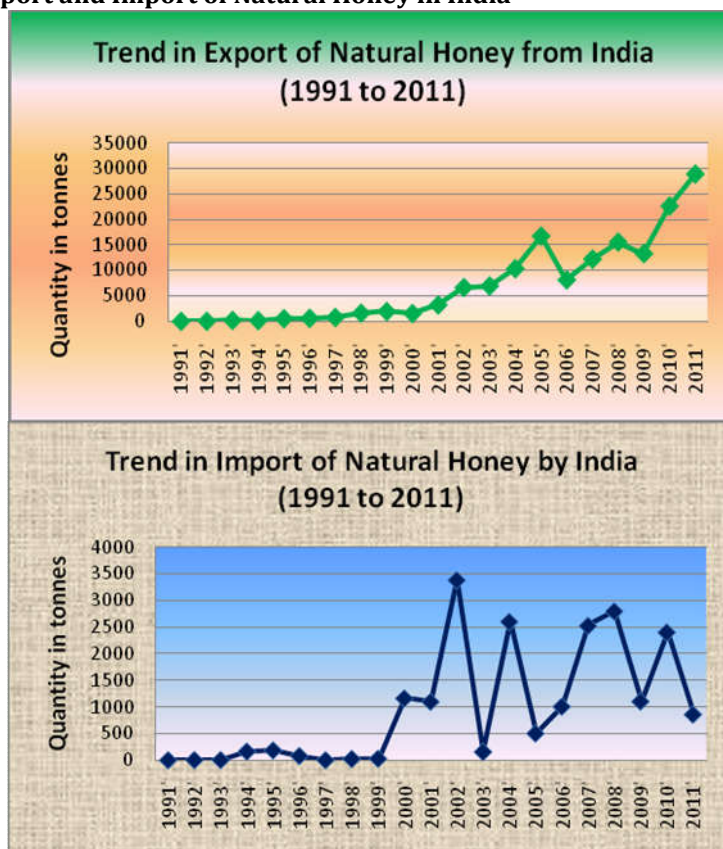
India has been identified as a potential point of transhipment for Chinese honey enroute to the United States. True Source Certified was aimed to help identify and certify honey that has met the expectations of Government, Industry and Consumers: Fully traceable, high quality honey of pure Indian origin. True Source Certified would help to preserve the image of Indian honey and that of legitimate Indian exporters and validate the livelihood of approximately 250,000 beekeepers.

North East Region of India and Maharashtra are the key areas for natural honey production. The country has exported 25.78 thousand MT of natural honey to the world for the worth of Rs. 356.28 crores during the year of 2012-13. United States, Saudi Arabia, United Arab Emirates, Yemen Republic and Morocco are the major export destinations. Trend in export and import of natural honey in India over two decades was

depicted in the table 1. The export performance of natural honey showed increasing trend for past ten years. During 2002, the imports of natural honey reached peak level but later on showed up and down trend for past ten years.

CHANGING DIRECTION OF TRADE OF NATURAL HONEY IN INDIA:
The four major importing countries for natural honey taken for this analysis were USA, Saudi Arab, U Arab Emts, Yemen Republic with the remaining importing countries grouped as others. As could be seen from the table 2, the transition probability matrix indicated that India's previous natural honey export to the USA market was retained to the level of 34 per cent during the current period. The remaining 66 per cent was diverted to other countries. However, USA has probability to gain U Arab Emts import market (100 per cent) followed by Yemen Republic import market (55 per cent) and of other countries (17 per cent).

Table: 2 Transitional Probability Matrix for India's Export of Natural Honey

	U S A	Saudi Arab	U Arab Emts	Yemen Republic	Others
U S A	**0.341351**	0.004899	0.001922	0.000365	0.656123
Saudi Arab	0	**0**	0.681321	0	0.320804
U Arab Emts	1	0	**0**	0	0
Yemen Republic	0.545433	0	0	**0.454567**	0
Others	0.167929	0	0	0.005289	**0.826782**

India could not retain its previous export of natural honey to Saudi Arab and U Arab Emts during the study period. The entire share of Saudi Arab was directed to U Arab Emts (68 per cent) and other countries (32 per cent). The entire share of U Arab Emts was directed to USA alone. India's previous natural honey export to the Yemen Republic market was retained to the level of 45 per cent during the current period. The remaining 55 per cent was diverted to USA alone. India's previous natural honey export to the other countries was retained to the level of 83 per cent during the current period. The remaining 17 per cent was diverted to USA alone. However, other countries gained 32 per cent of the Saudi Arab import market and 66 per cent of the USA import market.

The four major exporting countries of natural honey to India taken for this analysis were China, United States, Australia, Malaysia with the remaining exporting countries grouped as others. As could be seen from the table 3, the transition probability matrix indicated that India could not retain its previous import of natural honey to China and Australia during the study period. However, China has higher probability to gain 98 per cent and 85 per cent of the United States and Malaysia export market respectively

India's previous natural honey import from the United States market was retained to the level of 1.5 per cent during the current period. The remaining 98.5 per cent was diverted to China alone. However, United States has probability to gain 1.8 per cent and 25 per cent of the China and other countries export market respectively.

Table: 3 Transitional Probability Matrix for India's Import of Natural Honey

	China P Rp	United States	Australia	Malaysia	Others
China P Rp	**0**	0.017925	0.810301	0.140208	0.030306
United States	0.982338	**0.014569**	0.005093	0	0
Australia	0	0	**0**	1	0
Malaysia	0.854815	0	0	**0.072746**	0.071748
Others	0	0.249838	0	0.700953	**0.049209**

The entire share of Australia was directed to Malaysia (1.00) alone. India's previous natural honey import from the Malaysia market was retained to the level of 7.3 per cent during the current period. Of the remaining 92.7 per cent, 85.5 per cent was diverted to China and 7.2 per cent to the other countries. Also, Malaysia has higher probability to gain Australia export market (1.00) followed by other countries export market (0.70) and of China (0.14).

India's previous natural honey import from the other countries market was retained to the level of 5 per cent during the current period. The remaining 95 per cent was diverted to Malaysia (70 per cent) and United States (25 per cent). However, other countries gained 7 per cent and 3 per cent of the Malaysia and China export market respectively.

CONCLUSION

The present study was undertaken to analyse the pattern of export, import and balance of trade of natural honey in India revealed that the export performance of natural honey showed increasing trend whereas the imports of natural honey showed up and down trend for past ten years. India's previous natural honey export to the USA market was retained to the level of 34 per cent and remaining 66 per cent was diverted to other countries category. India's previous natural honey export to the Yemen Republic market was retained to the level of 45 per cent and remaining 55 per cent was diverted to USA alone. India could not retain its previous import of natural honey to China and Australia. India's previous natural honey import from the Malaysia market was retained to the level of 7.3 per cent and remaining 92.7 per cent was diverted to China (85.5 %) and other countries (7.2 %). Indian honey offers tremendous export potential. For tapping its potential, there is need to chalk out suitable export strategy. Some of the points are application of advanced technology for collection, and processing of honey, adhering strictly to the quality standards, recognition of bee keeping as agro-industry and developing an efficient export marketing network to optimise the production and exports. Timely implementation of the above steps coupled with the special package of assistance announced recently by the Commerce Minister while announcing the new foreign trade policy for export of minor forest products including honey is likely to pave the way for a quantum jump in the export of honey from the country in the coming years.

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