Executive summary

Introduction

This evaluation examines the effectiveness, efficiency, coherence and relevance of the six measures under the Common Agricultural Policy (CAP) supporting the general conditions for the production and marketing of apiculture products[1].

The six measures include 1) technical assistance to beekeepers and groupings of beekeepers 2) varroasis control 3) rationalisation of transhumance 4) measures to support laboratories carrying out analyses of the physico-chemical properties of honey 5) measures to support the restocking of hives in the Community and 6) cooperation with specialised bodies for the implementation of applied research programmes in the field of beekeeping and apiculture products.

These measures are included in *Apiculture Programmes* of the individual Member States covering periods of three years. The aim of this approach is to have sufficient flexibility to take into account the very different production conditions and yields across the EU, and the large number and variety of economic operators at both the production and marketing stages.

The European Union covers 50% of the expenditure borne by the Member States. The available EU budget for contributing to the Apiculture Programmes has been around 30 million EUR per year during the evaluation period 2008-2011[2]. Member States receive funds for their three-year national programmes in accordance with their share in the total number of beehives in the EU.

The evaluation covers all 27 EU Member States, offering in-depth analysis from four case-studies regarding Member States that are major producers of honey in the EU: Germany, Greece, Hungary and Spain.

The evaluation study is based on extensive desk research, interviews, surveys and fieldwork. A large ad hoc data set was generated specifically for this evaluation in view of the limited information available in the national programme reports.

The most frequently used measures during the evaluation period 2008-2011 were varroasis prevention and technical assistance. Each of these two measures accounted for just over one quarter of the budget used[3]. Measures designed to ensure rationalisation of transhumance accounted for 18% of total expenditure, while hive restocking measures represented 15%. Measures in favour of honey analysis and applied research each represented 6-7% of expenditure.

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[1] The six measures covered by the evaluation are set out in articles 105 to 110 of the single CMO Council Regulation (EC) No 1234/2007 establishing a common organisation of agricultural markets and on specific provisions for certain agricultural products. The detailed rules on implementation are in Commission Regulation (EC) 917/2004 and subsequent amendments e.g. Commission Regulation (EC) 811/2007. The previous regulation was Council Regulation (EC) 1221/97 that included the present six measures except the measure of support to laboratories that has only been available since 2005 following Council Regulation (EC) 797/2004.

[2] For the evaluation analysis data have been used from 2005 onwards or from 1965 in case of assessing long term trends.

[3] The total budget on all Apiculture Programmes, including the co-financing by the EU, therefore amounts to approximately 60 million EUR per year.

Overview of the apiculture sector

The EU is the world's second largest honey producing area, accounting for 23% of global production. (Asia is the largest, with 43%[4]). The EU is the main importing area (38.2% of global honey imports) and, together with the US and China, a major consumer (20-25% of global consumption). The EU self-sufficiency rate rose moderately to around 60% after the accession of several honey producing countries, e.g. Hungary, Poland, Bulgaria and Romania, and has been fairly stable since 2007.

The EU has an estimated 500 000 beekeepers with around 14 million hives. Professionals, i.e. those with 150 hives or more, account for only 5% of the total number of beekeepers, and own approximately 40% of EU beehives. Yields per beehive vary considerably across the EU[5]. Several factors play a role in this, e.g. climate, nectar quantities and density of bee colonies, but so do variations in the size and form of hives used in each region.

In Europe the number of hives has shown a long-term decline whereas the honey production quantity has remained rather stable. The number of beehives fell by 25% between 1965 and 2010[6]. This decline started in particular around 1985 and has largely stabilized since 1995. The drivers of this decline mentioned in the academic literature and policy papers as well as in the interviews and surveys are many e.g. demographic drivers (aging of the beekeepers), economic drivers (reduced profitability due to import pressure and the increased buying power of large intermediaries such as wholesalers and retailers), but also biological drivers (pests and diseases), chemical drivers (insecticides and pesticides) and environmental drivers (anthropogenic degradation). Several factors are hampering the assessment of the relative importance of these drivers e.g. absence of adequate monitoring systems producing reliable data sets for measuring bee colony decline and identifying causes and solutions, insufficient availability of applied research as well as insufficient understanding of economic opportunities offered by diversification of production and marketing into products other than honey.

Impacts on production, marketing, trade, income and prices

Production

Honey **production** in the EU-27 has remained largely stable over the last decade. After a relatively sharp increase at the beginning of the first decade of the century, it remained within a range of ±2.5% of the average for the rest of the decade. The measures (including those under earlier Regulations) appear to have indeed supported production at current levels despite rising production costs and price-competitive honey imports from third countries and despite threats from diseases. The latter come not only from varroasis, but also from diseases such as nosema, and American foulbrood.

The main effect of the apiculture measures has been a contribution to the stabilisation of the production of honey in the EU through gains in productivity and quality. The technical assistance measure appears to have made a particular contribution to productivity and quality

[4] Back in 1965 the relative shares of global production of the Asian and European continents where about the reverse of today's figures. Over the period 1965-2010 the two continents produced about the same quantity of honey.

[5] Contrary to Asia where, according to econometric tests carried out in the evaluation study, honey production and the number of beehives have been strongly cointegrated and strong statistical evidence of causality running from the number of beehives to the quantity of produced honey has been found.

[6] Due to data limitations in the FAO statistics for assessing the long-term trend since 1965 figures of Europe as a geographic continent had to be used instead of the EU. According to the same database the EU the decline in beehives between 1985 and 2010 was around 13%.

gains through training, by enabling the dissemination of technical information among beekeepers and facilitating the acquisition of new, more efficient equipment for the production of honey and other apiculture products.

The impact on production of the measure supporting the fight against the varroa parasite, which is a major threat and costly to combat, has been very positive. However, in some countries the take-up of the measures was limited. This was due to the fact that the procedures associated with obtaining the assistance on fighting varroasis were felt to be too burdensome by beekeepers or due to lack of a national budget for this particular measure.

The measure supporting the rationalisation of transhumance was found to be highly valued in the case studies carried out in Greece and Spain. It was rarely used elsewhere in the EU as the measure is more suitable for professional beekeepers with large numbers of hives.

Where applied, the restocking of hives received general support from beekeepers and the effect on production was found to be clearly positive.

The associations and individual beekeepers consulted in the evaluation expressed unanimously their belief in the *potential* importance for honey production of the applied research measure.

Marketing

The measures have generally not had a substantial impact on the national compositions of **marketing** channels for honey. For example, all the honey produced in Germany remained to be sold locally and through direct sale, while around 50% of the honey produced in Spain is still sold to wholesalers.

According to the surveys conducted in the evaluation, the measure to support laboratories carrying out analyses of the physico-chemical properties of honey has contributed to the quality of honey and thus facilitated its marketing. Promotion of honey supported by actions developed under the national programmes has led to increased awareness of consumers of the quality of honey produced locally and thus to their willingness to pay a higher price. This was for example the case in Germany thanks to the quality label and also in Hungary through the Hungarian producers honey jar.

Trade

Both intra-EU and **trade** with third countries remained relatively stable between 2008 and 2011. Intra-EU imports and exports have been around 105 000 tonnes in this period. Imports from non-EU countries (around 140 000 tonnes) were over 10 times the exports to non-EU countries (about 11 000 tonnes). Since 2000, exports of honey from the EU to third countries approximately doubled, while imports from third countries increased by some 15%. Any causal effect between the measures and these increases is, however, hard to establish as world demand has been rising.

In principle, by favouring the maintenance of EU domestic production, the measures may have contributed to stimulating honey exports and containing imports. However, direct substitution between the different types of honey produced in the EU and imported honey appears to have been quite limited. The factors determining domestic and global demand are also very complex, making it difficult to assess precisely the trade enhancing effect of the positive production effect brought about by the apiculture measures.

However, there appears to have been some local, targeted positive trade effects of the measures, arising from quality promotion. The *quality* of the honey produced is a major factor for remaining competitive, and several of the measures served this objective. The overall maintenance of high quality levels in EU honey production has been a factor contributing to a widening (positive) gap between the average honey export price and the average honey import price.

There appears to have been a moderate positive effect of the apiculture measures on the keeping and trade in live bees. Trade in live bees remained largely local and limited. Beekeepers usually breed their own queens and swarms to restock their hives to cover losses suffered during the winter and due to other causes.

Costs and income

There has been a strong rise in beekeepers' production **costs** in recent years. This has been caused by increased bee mortality rates of 30-50%, which have driven up the price of colonies, in some cases fivefold[7] and by rising fuel costs which affect the cost of transhumance, particularly in drought-prone countries (e.g. Spain), where beekeepers had to scale up their transhumance to cover larger distances to provide their bees with sufficient food. In addition, there has been an increase in the price of treating varroasis, and an increase in the use and cost of non-natural feeding costs, such as sugar.

These price increases have hit the **income** of beekeepers and of farmers for whom it is a side-line, since substantially higher production costs have not been matched by corresponding increases in selling prices. The measures have limited the impact of the higher costs in a number of ways. They have supported the use of varroa medication and the restocking of hives (supporting transport-related costs in countries such as Spain or Greece where transhumance is extensive). They have also provided investment support aiming at more efficient production, extraction, processing and conditioning of honey as well as support for investment in equipment to handle and move hives (such as trailers, pallets, loading equipment, cranes, covering mesh) and investment in new hives, bee packages, bee swarms, queen bees, etc.

Where diversification was included in the national apiculture programmes, the apiculture measures encouraged the diversification of beekeepers' **sources of income** as these raised awareness on the potential of producing other apicultural products such as royal jelly.

The **applied research** measure made it possible to fund 'qualitative and quantitative evaluation of royal jelly components' as well as a 'study of propolis'. It resulted from the case studies conducted in the evaluation that the demand for these types of products exceeds supply, but that beekeepers are currently insufficiently aware of the full potential of these markets.

[7] Working Party on Honey, COPA COGECA, (2009, "European Beekeeping at a crossroads, Strategic plan proposed by European beekeepers', http://www.biodlarna.se/website1/10.0.1.0/158/Strategisk%20plan%20Copa%20091118.pdf.

Prices

Between 2005 and 2010, there was a steady yet significant increase in **producer prices** (the price received by beekeepers at the farm-gate or at the first point of sale). Looking at the four case-study countries, prices rose in a range from 35% in Germany to 126% in Hungary.

However, the use of such average prices can only be a broad-brush indicator because the origin and type of honey, as well as the sales channel, market structure and country all influence the price level of honey. Through case studies, interviews and desk research it was found that market conditions are the main driver of producer prices. By contributing to stability of production the apiculture measures have made a contribution to price stability, since 60% of EU consumption is domestic. However, it was not possible to find in the evaluation a general relationship between the apiculture measures and prices. World honey market conditions and national market structure determine to a large extent the transmission between favourable effects on production and honey prices. For standard honeys the world market sets the price. The support measures may have influenced the prices obtained for the more distinctive and expensive types of honey.

Impacts of the measures on the production structures

The structure of production of beekeeping activity is one of the main channels for improving the production and marketing of apiculture products.

The apiculture measures for individual beekeepers, such as **technical assistance**, **rationalisation of transhumance** and **control of varroa** have enabled beekeepers, particularly the professional beekeepers, to acquire modern production equipment. This has spurred the mechanisation of beekeeping and therefore enhanced productivity in the sector. Furthermore, having access to modern equipment through the apiculture measures has enabled beekeepers to treat varroasis more efficiently.

Measures benefiting collectives of beekeepers, such as **technical assistance**, **control of varroasis** and **rationalisation of transhumance**, have also resulted in structural improvements. These measures include dissemination of information through training courses or newsletters. Collective measures have made improvements in beekeeping practices possible, both for professionals and non-professionals, and have been particularly useful in informing beekeepers of adequate varroa treatment practices. This was particularly useful and necessary for non-professionals in order to limit one of the negative externalities, the spread of varroa, generated by beekeeping. Fighting varroa requires a collective effort, as it can spread from apiary to apiary if it is not treated.

Collective measures have also contributed to increasing productivity, by providing beekeepers with market information, such as on the pollination potential of a specific area. However, there is scope for more use of promotion of collective measures.

The measures have had some impact on increasing the number of professional beekeepers, in part because eligibility for the measures was restricted to professionals in some countries. This has not been enough to change the difference in beekeeping structures across the EU in terms of the number of full-time and part-time professionals and those keeping bees as a hobby or side-line.

Overall, therefore, the measures have contributed to rendering beekeeping more productive and have led to structural improvements in the sector.

Impacts of the measures on the downstream sector

The apiculture measures intend to ensure sufficient levels of production to meet the needs of the downstream sector. The downstream sector includes honey packers, industry and wholesalers, and retailers, who are a major stakeholder.

The needs of the downstream sector mirror that of consumers: their price-sensitivity is related to the type of honey which they purchase. Customers are willing to pay a higher price for specialist honey, and notably local specialist honey, but are not ready to pay the same premium for honey mixes.

Honey mixes enable the downstream sector to blend different types of honey, and to change the mix if the price of a particular honey increases. This renders the market for this type of honey extremely competitive as EU producers selling into this market face strong competition from abroad, notably South America and China. There are therefore two distinct honey markets: high-end specialist honey and honey used in mixes.

A number of elements must be kept in mind when evaluating whether the measures have made it possible to meet the needs of the downstream sector. Firstly, the downstream sector has very limited knowledge of the measures, as it attaches greater attention to price and output trends.

Furthermore, as honey is an international market, the downstream sector is clearly influenced stronger by price developments related to climatic events or regional crises than by the apiculture measures.

Moreover, as the EU's self-sufficiency ratio is rather low (60%), imports are inevitable to meet overall household and industrial demand in terms of quantity.

At the high end of the honey market, the measures, and notably the **technical assistance** and **varroa control** measures, have provided beekeepers with tools to adapt to developments in the market. The measures contributed to stabilising the market and increase prices, in particular through the product quality measures, such as the **support to laboratories**.

These findings of the evaluation indicate that the apiculture measures contribute to ensuring that the downstream sector has access to high-end honey, and lower-end quality honey at a competitive price from within the EU.

Impacts on rural areas and environment

The measures for apiculture have supported the sustainability of beekeeping in rural areas, as well as the entire system of economic activities which gravitates around it. This includes not only suppliers but also, indirectly through pollination, farmers. The measures, and particularly the **technical assistance** and the **rationalisation of transhumance measure** have spurred productivity gains and competitiveness through enhanced mechanisation of beekeeping activity, increased awareness of adequate beekeeping techniques and through the provision of market information. The measures have contributed to reducing production costs, notably the measures for **varroasis prevention**, **restocking of hives** and **support to laboratories**. The measures have also enabled beekeepers to diversify their income by producing other apicultural products such as royal jelly or wax, notably through the **technical assistance** and the **applied research** measures.

By contributing to the economic viability of the sector, the measures have supported the maintenance of beekeeping, which remains predominantly a rural activity. Keeping beekeepers in business generates broader impacts in terms of rural development than just

securing an income for beekeepers. Indeed, positive externalities, in terms of local employment and activity, are produced for the entire honey production value chain.

The case studies carried out in Germany and Spain highlight the fact that the measures have had a positive impact on other segments of the value chain, and notably the retail sector, the technical equipment sector, the sugar industry, the glass industry and SMEs.

The combination of all the apiculture measures supported the sustainability of economic activities around beekeepers in rural areas.

Although the measures, through their support of honey production, contributed to maintaining direct and induced jobs in rural areas, apiculture's most substantial contribution to local employment possibly lies in the externalities created through pollination. Numerous crop and plant producers could not carry out their activity without pollination, with an estimated share in pollination of 60-80% of pollination by bees frequently estimated in the academic literature[8]. The overall pollination activity of the bees depends crucially on that of beekeepers. Beekeeping therefore plays a crucial role in EU agriculture and development in rural areas.

As pollination remains more of a positive externality delivered by honeybees than an activity in itself, the impacts of the apiculture measures on rural development and the environment are brought about by their positive influence on the bee population. The varroa measures have provided beekeepers with an incentive to adopt environmentally friendly forms of control, e.g. through biological products.

Efficiency and administrative burden of the measures

Drawing up the apiculture programmes with the measures was not found to be an especially onerous requirement.

Bureaucracy was not generally identified as a major drawback at national level, although there were Member States where the paperwork and the time taken to decide on applications were felt to be excessive, and the perception was that more could be done to move to complete procedures electronically.

The decentralised management of the measures at regional level in some Member States appeared to have created inefficiencies in the implementation of the measures. Within countries differences existed between regions regarding the acceptance of different types of varroasis control products and equipment. This discrepancy reduced the profitability for laboratories, discouraging them from developing products because it limits their market share, and consequently increases the market price of products for beekeepers. Furthermore, in the case of equipment eligible for co-financing under the measures, the differences across regions may have caused comparative advantages or disadvantages for beekeepers in different regions.

It can be concluded that the measures operated efficiently at EU level.

[8] This estimate includes wild bees. Even if the pollination share of the bees kept in hives would only be around 10%, the lowest estimate found in the literature, the conclusion on a positive economic effect of the measures in the rural area remains valid. See for references on the pollination effect of beekeeping e.g. http://ec.europa.eu/food/animal/liveanimals/bees/index_en.htm and http://www.efsa.europa.eu/en/topics/topic/beehealth.htm.

Coherence with the CAP and EU policies

It has been found in this evaluation that the CAP measures supporting the apiculture sector are coherent with the CAP as a whole.

In accordance with the CAP objectives the apiculture measures have contributed positively to productivity and earnings of beekeepers, to stabilising markets and assuring availability of supply for the downstream sector and for consumers as well as to ensuring supply at reasonable prices. Through investment aid and through increasing knowledge and technical skills of beekeepers, the apiculture measures have helped to increase beekeeping productivity and thus supported incomes of beekeepers and farmers.

The apiculture measures have contributed to the achievement of the CAP objectives for Rural Development such as economic development, sustainable management and biodiversity. Regarding plant protection practices that are considered to be harmful for bees the European Council decided on a temporary ban for neonicotinoids in April 2013.

A wide range of EU bodies (including four European Commission Directorates, an EU Agency (EFSA) and an appointed national institution (ANSES)) have competencies linked to beekeeping, participate in beekeeping research projects and bee health initiatives. No major incoherencies among the policies of these bodies were found. Coherence has certainly been supported by the inter-service group on apiculture that meets every month. In view of the findings of the evaluation there is still room for a stronger coordination and larger dissemination of the results of the beekeeping research projects funded by the EU. Stronger coordination and larger dissemination would make the apiculture measures more effective e.g. by reducing bee loss and by fostering production improvements.

Overall, the measures and actions under the National Apiculture Programmes were found to be coherent with the CAP measures supporting apiculture as set out in the articles 105 to 110 of Council regulation (EC) 1234/2007.

Recommendations

- The six current support measures should be maintained. They were found to be effective as a group and to cover together the main needs of the sector, while providing sufficient flexibility to account for the diversity of conditions in Member States.
- The formulation of the objectives at EU level must be clearer in order to bring about a more holistic policy approach to the apiculture sector. It should be clear whether the priority of the apiculture measures is to consolidate the development of a competitive professional sector or to increase the spread of beekeeping activities through a higher number of non-professional beekeepers (providing, inter alia, environmental benefits), or whether the measures intend a combination of both. Although national conditions need to be taken into account clearer and more specified objectives at the EU level will improve the effectiveness and coherence of the measures.
- Greater synergies should be realised between the various bee-related research initiatives funded by the EU. Applied research funded through the CAP apiculture measures must be coherent with other research on bees funded by the EU. Greater synergies of EU research projects on bees need to be achieved e.g. through conferences and policy coordination organised by the Directorate-Generals of the European Commission.

- Marketing efforts promoting honey sales in those Member States where local honey quality is insufficiently valued should be scaled up in the Apiculture Programmes. This would enable beekeepers to move up the value chain and produce and sell higher quality honey, which is less subject to international competition, and which can be sold directly to consumers. The apiculture measures should be supported by consumer information campaigns.

- With a view to providing reliable evidence for decision making on the Apiculture Programmes, further efforts – along the lines of the study already coordinated by the EU Reference Laboratory for Bee Health – should be made to monitor bee colonies in the EU. It should be explored how registration and follow-up requirements could be part of the eligibility criteria for support in order to achieve such an objective.

- Promotion of cooperation among beekeepers through the apiculture measures should be strengthened. This would not only centralise resources and reduce costs, but also increase knowledge sharing and the effectiveness and relevance of the apiculture measures.