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Report Highlights:
German society remains conflicted regarding genetically engineered (GE) plants and this is reflected in mixed policies and messaging. Public rejection is widespread, there is no commercial GE crop production, the government has banned the planting of some EU-approved GE crops, and practically no foods labeled as “GMO” are sold in Germany. Despite this, Germany is home to world-class companies that develop and supply GE seeds globally. Germany’s livestock industry is a major consumer of imported GE soybeans for use as animal feed. However, the industry is under steady pressure to move away from GE feeds. GE animals are currently not topical in Germany.

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Section I. Executive Summary:

Germany is the most populous and economical powerful country in the European Union (EU). Germany is quite influential in agricultural policy, both within the EU and globally. Germans are usually willing to innovate and open to new technology but agricultural biotechnology occupies a unique political space. German society remains conflicted regarding agricultural biotechnology and this is reflected in mixed government policies and messaging. Public rejection of GE crops is widespread. For nearly a generation, German environmental and consumer activists have protested against the use of biotechnology in agriculture, both in Germany and globally. Biotech test plots - which are used both as a research tool and are a required part of the EU regulatory approval process - are routinely destroyed by vandals, to the point where test plots are no longer attempted in Germany today. The Federal government has banned the planting of an EU-approved GE corn. Many local governments and organizations within Germany have instituted biotech free zones.

In the current environment, other than the existing feed market for soybeans, there is little prospect of developing a German market for GE crops or foods. Beyond this, political, business, regulatory, and social barriers raise questions about the long-term competitiveness of German plant biotechnology. Germany has given rise to world-class developers of GE crops, such as Bayer CropScience, BASF, and KWS. These companies are major suppliers of GE seeds and technologies to markets outside of Europe. However, in January 2012, BASF announced that it is moving its agricultural biotech operations from Germany to the United States, citing poor and deteriorating attitudes toward GE crops and poor marketing prospects in Europe. Germany nonetheless remains a major consumer of GE products because it imports more than 6 million metric tons of soybeans and soy meal for animal feed.

GE animals are currently not high on the political agenda. There is little public awareness or discussion of GE animals.

Section II. PLANT AND ANIMAL BIOTECHNOLOGY

Chapter 1; Plant Biotechnology

Part A: Trade and Production:

a. PRODUCT DEVELOPMENT: German seed companies such as Bayer Crop Science, BASF, and KWS develop GE plants or crops. However their production sites are outside of Europe.

b. COMMERCIAL PRODUCTION: There is no commercial production of GE crops in Germany. In addition, GE seeds are not produced in Germany for sale abroad. However, German seed companies - including Bayer CropScience, BASF, and KWS – supply biotech seeds to farmers worldwide from production sites outside of Europe. KWS, for example, is a leading supplier of GE sugar beets used by U.S. farmers. Monsanto's MON 810 insect resistant corn was cultivated in Germany until April 2009, when it was banned by Food, Agriculture, and Consumer Protection Minister Ilse Aigner.

c. EXPORTS: There is no commercial production of GE crops in Germany and Germany does not export GE crops to the United State or other countries.

d. IMPORTS: Germany is a major livestock producer and is dependent upon imported soybeans and soybean meal as a feed protein source. Germany's consumes more than 6 million metric tons (MMT) of soybean meal equivalent annually, nearly all of it produced from GE varieties. The main suppliers are Argentina, Brazil and the United States. Although soybeans are the largest U.S. agricultural export to Germany, official data suggest the U.S. share of the German soybean market was only about 19 % in 2012.

e. FOOD AID RECIPIENT COUNTRIES: Germany is not a food aid recipient

Part B: Policy:

a. REGULATORY FRAMEWORK: As the largest EU member state, Germany plays a significant role in the regulatory acceptance of GE crops in Europe. This includes voting at the EU level on approvals and transferring and incorporating EU laws into German legislation, establishing liability for GE 'contamination,' and enforcement. Member states also carry out initial risk assessments for a GE crops.

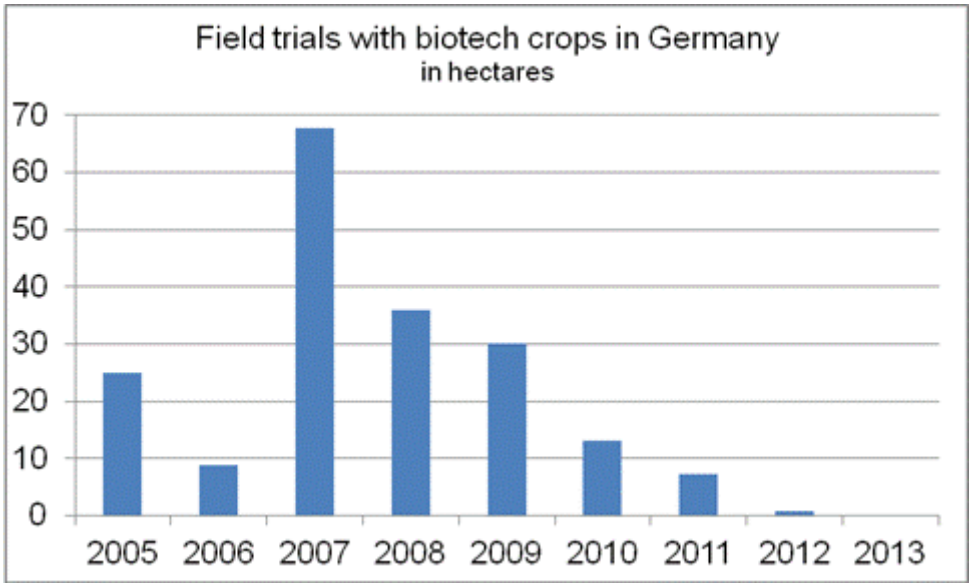
Within the EU, GE crops are authorized on a case-by-case basis of the particular uses defined by the applicant. The EU regulatory framework for biotechnology primarily works through regulations and directives. (Our GAIN report dated August 3, 2012 has much more detail on the EU regulatory process.) The Federal Office of Consumer Protection and Food Safety (known by its German abbreviation BVL) is the German authority responsible for regulating GE crops. The BVL is an autonomous part of the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV).

In practice, the BVL receives a notification of a GE approval request, passes the notification dossier to the European Food Safety Authority (EFSA), checks the completeness and quality of the data supplied in the dossier, evaluates the risk analysis of the notifier, and issues its own statement to the EFSA. BVL also evaluates the safety of biotech crops that are used in contained systems (i.e., for research or industrial production). It also issues environmental release permits and conducts environmental monitoring. The BVL does this under the authority of Germany's Genetic Engineering Act, which implements EU guidelines as national legislation.

While primary responsibility for GE policy in Germany rests with BMELV, the Ministries of Economics, Health, Research and Environment are also involved in the opinion and decision-making process and need to approve Germany's voting decision in EU committees and councils.

b. APPROVALS: The German voting patterns on approvals at the EU level in some ways contrasts sharply with its local regulation of GE crops. In the case of MON 810, Germany voted to approve it and German farmers cultivated MON 810 for several years. However, MON 810 was banned in by Germany in April 2009. Since the mid 1990's, there have been about 50 GE product approvals voted upon at the EU level. There have been only two German objections in recent years (for EH 92-527-1 potato and TA 45 rapeseed) but in May 2012, Germany abstained from the vote for the approval of MON87701xMON89788.

c. FIELD TESTING: Germany companies and universities have in the past conducted small field trials of biotech plants but the number has decreased over the past few years. In 2007, experimental releases totaled nearly 70 hectares but by 2013, there were no more field trials.



Source: German Field Register

German law requires the exact location of a test plot be made public on the internet, which made it easy for vandals to act (here is a link to the mapping system). Vandalism is a

significant barrier to conducting field trials in Germany.

d. STACKED EVENT APPROVALS: Stacked events are subject to risk assessment on EU-level. The approval process is the same as for single events. Risk assessment of stacked events follows the principles provided in EFSA's Guidance Document, which stipulates that where all single events have been assessed, the risk assessment of stacked events should focus mainly on issues related to a) stability, b) expression of the events, and c) potential interactions between the events.

e. ADDITIONAL REQUIREMENTS: German farmers producing GE crops must register their fields with the governmental body BVL three months before planting.

f. COEXISTENCE: Germany's policy of "coexistence" between GE and conventionally-grown and organic crops is biased against the use of GE crops. German federal and local governments have put into place an assortment of planting bans, segregation distances, and other requirements. For instance, Germany requires a minimum distance of 150 meters - a football field-and-a-half -- between biotech and conventional fields, and a minimum distance of 300 meters between biotech and organic cornfields. Brandenburg is the only federal state in Germany that put into place a minimum segregation distance between GE crops and nature reserves of 800 meters.

Some state-level (Laender) governments in Germany have also declared themselves biotech-free. The states of Baden-Württemberg, Bremen, Hamburg, Mecklenburg-Western Pomerania, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Schleswig-Holstein, Thuringia all support biotech free to some degree. Governing coalitions of political parties have 'biotech free' in their coalition agreements and in some states growing biotech crops on state owned land is prohibited. With the exceptions of Hamburg, Mecklenburg-Western Pomerania, Saarland, and Thuringia the Green Party is part of the governing coalition in these states.

There are over 200 self-declared 'biotech-free zones' in Germany. The first biotech free region in Germany was founded in 2004. Biotech-free areas are formed by voluntary agreement among farmers to not plant biotech crops in the region and there is no legal enforcement mechanism connected to the declaration. In part, these declarations are used to help promote a regions image and attract tourism. Biotech-free areas are especially popular in the southern state of Bavaria.

The total area covered by these biotech-free zones in 2013 amounts to about 1.1 million hectares of arable land with over 30,000 participating farmers. This is equivalent to more than 6% of Germany's farmland (arable land and grassland).

Germany's influential Catholic and Protestant churches have also taken strong anti-biotech positions and biotech crops are generally not allowed on church-owned lands (churches have significant agricultural holdings in Germany). Land rental contracts usually forbid farmers from growing biotech crops on church owned land or to refrain totally from biotech crops if only part

of the land they work is rented from a church. For more information about biotech-free areas see: http://www.gentechnikfreie-regionen.de

g. LABELING: Germany applies EU regulations for labeling GE foods (Regulations (EC) 1829/2003 and 1830/2003). No 'GE' labeled foods are currently sold in Germany. However, under EU rules, foods require a label only if GE crops are used as an ingredient. For example, there is no labeling for meat or dairy products coming from animals fed with GE feeds.

In 2008, the German government legislated a voluntary "gene technology free" labeling program. In August 2009, the Ministry for Food, Agriculture and Consumer Protection introduced a national label to help consumers better identify products and to standardize the information consumers receive. This label is heavily promoted to the public by the Ministry.

Food manufacturers can use an official label on their products only if they comply with strict documentation requirements. Eggs and cheese are the most popular products sold under this labeling scheme. Interestingly, the label may not be used for products for which no biotech varieties exist, such as oranges or basmati rice, among others. The administration of this program is largely entrusted to the "Verband Lebensmittel ohne Gentechnik e.V." (non-Biotech Foods Association). As of May 2013, the Association claims that 124 companies have a license to use the label.

h. TRADE BARRIERS: Most GE-related trade barriers in Germany have their origins in EU regulation, especially the slow EU approval process for GE plant varieties commonly planted outside of Europe. Germany strictly enforces EU directives, testing guidance, and other import rules relating to the presence of unapproved GE crops in food and feed.

i. INTELLECTUAL PROPERTY RIGHTS: German intellectual property law mainly consists of the Copyright Act (UrhG), Patent Act (PatG), Trademark Act (MarkenG), Utility Model Act (GebrMG) and Design Rights Act (GeschMG), flanked by some provisions of the Civil Code (BGB) and the Act Against Unfair Competition (UWG). All of these bodies of law have histories dating back to before German membership in the European Union (EU) but have since been revised and amended several times to implement European Directives and Guidelines or treaties. However, in Germany the Plant Variety Protection Act protects the intellectual property of New Varieties of Plants. A breeder can apply for plant variety protection for a new variety at the Federal Office of Plant Varieties (BSA). In Germany, plant variety protection it is an intellectual property right

separate from a patent.

j. CARTAGENA PROTOCOL RATIFICATION: Germany signed the Cartagena Protocol on Biosafety on May 24, 2000. It was ratified in November 2003, and entered into force on February 2004.

k. INTERNATIONAL TREATIES/FORA: Germany is a member of several international organizations dealing with plant protection and plant health like EPPO, OECD, FAO (IPPC), and Codex. The Federal Republic of Germany is the host country for a subsidiary body of the Codex Alimentarius Commission the Codex Committee on Nutrition and Foods for Special Dietary Uses.

l. RELATED ISSUES: In 2009, Chancellor Merkel's Christian Democratic Union (CDU)/Christian Socialist Union (CSU) party was re-elected and entered into a coalition with the Liberal Democrat Party (FDP). Their 2009 coalition agreement states, "Biotechnology has been established worldwide as an important new industry for research, business and agriculture and we want to responsibly utilize the potential of green genetic engineering. The protection of people and the environment remains the primary objective of Germany's genetic engineering law. We support a greater scientific focus and more efficient authorization procedures for genetically modified organisms at the EU level." Despite the wording, the coalition agreement has not translated into practical political support for science-based regulation of GE crops in Germany.

The next federal election is in September 2013. According to national polls, if national elections were held now (June) the CDU/CSU would get 41 percent; the Social Democrats (SPD), 24 percent; the Greens, 13 percent; the Left Party, eight percent; the FDP, four percent, and others six percent. Although not an outcome supported by current polling, a SPD/Greens coalition victory would put the agriculture and consumer protection portfolio (BMELV) under Green Party control, further entrenching Germany's anti-biotech position.

The German Federal Ministry for Education and Research (known by its German abbreviation BMBF) supports scientific institutes, companies or individual researchers through specific funding programs. Biotechnology is one of the key technologies of a strategy, which was adopted by the federal government in 2006 and has continued since 2010 under the title "High-Tech Strategy 2020". Under this strategy, the German Federal Government seeks to lead in Europe in terms of number of biotech enterprises, sales and employment figures. To advance research, the federal government has just launched a "National Research Strategy Bio Economy 2030". At present, there are 25 different ongoing programs to financially support scientists with research projects in this field.

For the past several years, the German Green Party, supported by a range of NGOs, has introduced policy proposals to end the importation of soybeans into Germany. The use of biotechnology in soybean production is a driver behind this movement. Under several proposals, soy imports would be replaced by domestically produced pulses and other protein

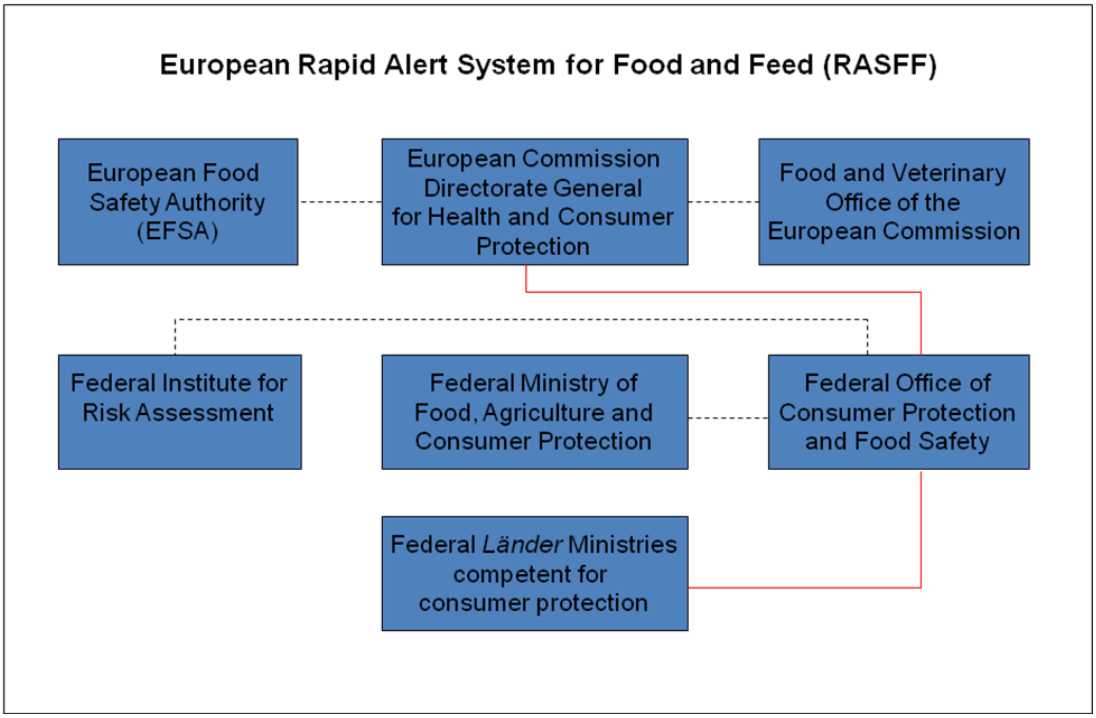
crops. However, a full replacement of imported protein feeds does not appear to be a realistic option in the near term.

Related to this, the German association for the animal feed and nutrition sector (DVT) and several major German food retailers have signed a declaration calling for Brazil to supply more of GMO-free soy to European consumers. (For more information see the Brussels Soy Declaration.)

The federal state of Bavaria is part of an initiative to produce more 'GMO-free' soy for the European market. The "Danube Soya Association" promotes the production and processing of non-biotech soybeans in Europe. Since January 2013, eight countries and Bavaria have signed the "Danube Soya Declaration": Austria, Bavaria, Bosnia Herzegovina, Croatia, Hungary, Romania, Serbia, Slovenia, and Switzerland. According to the "Danube Soya Association" the production potential for soybeans in the Danube region is 4 million metric tons.

m. MONITORING AND TESTING: Germany has a decentralized system for testing and controlling the illegal entry of GE products into Germany. The control authority with the competence to ensure that no unauthorized biotech product enters the German retail market is with the 16 German states (Laender). The Laender have their own monitoring and sampling plans. Since the experts know what kind of products potentially contain GE events they specifically sample for these products. Sampling is primarily done at the wholesale and the processing level.

Germany fully enforces EU rules relating to GE crops and the Rapid Alert System for Food and Feed (RASFF) is used to report food safety issues to consumers, the trade, and other member-states. In the case of biotech crop, Germany's 16 states (Laender) test for unauthorized GE products and report violations via the RASFF. There were 10 notifications in 2012. These were primarily noodles from China and the Philippines and papaya from Thailand containing unapproved events.



n. LOW LEVEL PRESENCE POLICY: Germany fully implements EU directives on LLP.

Part C: Marketing:

a. MARKET ACCEPTANCE: For nearly a generation, German consumers have been exposed to consistent messaging from non-governmental organizations that biotech crops are dangerous, a product of exploitive capitalism, and even immoral. As a result, the use of biotech crops in foods is a highly contentious and politicized issue. Since biotech crops were first introduced in the mid 1990s, attempts to educate consumers and opponents about the benefits of biotech crops and about science in general have proven ineffective.

According to the Federation of Food Law and Food Science, an estimated 60-80% of all food in German supermarkets has come in contact with biotech products in some way. The Union of German Academies of Science has concluded that objections to biotech in agriculture lack any scientific basis, and agricultural biotech tends to find stronger support among consumers with postgraduate degrees. Because there are broad exceptions to EU labeling requirements (e.g. food enzymes produced from GMO micro organisms, meat from animals fed GMO feeds, etc.), many German consumers do not believe there are biotech foods on the market.

Although the European Union has approved 31 biotech plants that would theoretically be legal to sell in Germany, practically no labeled biotech foods are on the market. One contributing factor is the concentration of the food retail sector and its vulnerability to narrowly focused consumer activists. The German retail food sector is dominated by five large retailers, which have more than 90 percent of the market. Germany also has the highest market share of the world's discount retail food stores. Within this low-margin but concentrated industry, anti-

biotech NGOs would likely target any retailer offering GMO-labeled products. This presents an unacceptable brand risk that hinders the introduction of GMO-labeled foods.

b. PUBLIC/PRIVATE OPINIONS: Years of controversy have produced a large number of polling studies on German and European attitudes toward GE crops. A very comprehensive study comes from the European Commission/Eurostat and is titled, European's and Biotechnology – Winds of Change (2010). Four findings from this study relative to the marketing of U.S. agricultural products are: 1) Opposition to GE foods is high and steady over time; 2) The level of support for GE foods is declining; 3) Familiarity with the technology or science does not improve attitudes; and 4) Educating consumers does not increase GE crop acceptance (implying that messaging is more important than facts).

Part D: Capacity Building and Outreach

a. ACTIVITIES: Since 1997, the USDA/FAS Office in Germany has sent numerous groups of policy makers, scientists, representatives' from consumer organizations, farm leaders, journalists and other interested parties to the United States to learn about the U.S. system for regulating biotechnology. In addition to these trips to the United States, FAS Germany has organized a number of speaker programs for U.S. policy makers, biotech scientists and farmers to inform interested parties in Germany about the U.S experience with biotech crops. The FAS Office in Germany has also participated in a number of podium discussions and seminars on GE. In September 2012, Paul Spencer, the Agricultural Counselor at the U.S. Embassy in Berlin, gave a speech at the annual Innoplanta Forum.

b. STRATEGIES AND NEEDS: There is not explicit political support in Germany for the role that GE and other new plant production technologies could play in promoting global food security. Germany has a specific need for a discussion about the growing global use of GE crops and the domestic and international implications of Germany's current hostility toward agricultural technology. Germany's bias against GE technology is also expressed through German-funded NGOs operating in developing countries (though the use of Government-granted funds for specific activities abroad is impossible to trace).

There is also the need to encourage science-based German and EU regulatory approaches to new agricultural technologies. This becomes more challenging with the development of new breeding techniques. There is no documentation of the evaluation of the new techniques and Germany's position on it. Therefore, it remains uncertain if they would fall under GE legislation.

Currently, GE technology is not high on political agenda at either the federal or regional level. At several universities basic research on GE crops is still conducted, though with very limited scope and with no foreseeable commercial opportunities. The incentives for plant scientists to emigrate to other countries are high.

Chapter 2: Animal Biotechnology
PART E: PRODUCTION AND TRADE

a. BIOTECHNOLOGY PRODUCT DEVELOPMENT: In Germany, research into GE animal biotechnology is mainly at the Friedrich Loeffler Institute (FLI) in its Animal Genetics unit. This is conducted in “closed system” laboratories.

b. COMMERCIAL PRODUCTION: There is no commercial production of GE animals in Germany.

c. BIOTECHNOLOGY EXPORTS: As there is no commercial production, there are no exports.

d. BIOTECHNOLOGY IMPORTS: There are no known imports of GE animals for agricultural purposes into Germany. Germany has imported unknown numbers of genetics and offspring from clones as part of normal herd improvements programs, particularly in the dairy sector.

Part F: Policy

a. REGULATION: As a Member State of the European Union, Germany implements the EU Regulation on animal biotechnology.

b. LABELING AND TRACEABILITY: There is no policy for the traceability and labeling of livestock clones. In discussion officials and representatives express the wish for traceability in the United States.

c. TRADE BARRIERS: Most GE-related barriers in Germany have their origins in the EU regulations. Germany strictly enforces EU directives, and other import rules.

d. INTELLECTUAL PROPERTY RIGHTS: German intellectual property law mainly consists of the Copyright Act (UrhG), Patent Act (PatG), Trademark Act (MarkenG), Utility Model Act (GebrMG) and Design Rights Act (GeschMG), flanked by some provisions of the Civil Code (BGB) and the Act Against Unfair Competition (UWG). All of these bodies of law have histories dating back to before German membership in the European Union (EU) but have since been revised and amended several times to implement European Directives and Guidelines or treaties.

e. INTERNATIONAL TREATIES: As a member of the European Union Germany is a member of Codex Alimentarius. Germany is also a member of the World Organization for Animal Health (OIE). Since May 2012 Dr. Schwabenbauer heads the OIE Council and World Assembly. She is the deputy head of the department animal health and animal welfare at the German Ministry for Food, Agriculture and Consumer Protection.

PART G: MARKETING

a. MARKET ACCEPTANCE: There is little awareness of GE animals among the German public.

b. PUBLIC/PRIVATE OPINIONS: Animal biotechnology is currently not high on the political agenda and there is currently no high profile lobbying for or against the use of livestock cloning. However, public views on cloning are widely believed to be similar to those held for GE crops. Past EU-level debates on the regulation of cloning have not received positive media coverage. There has been limited media coverage of cloning in the context of endangered or extinct species. The coverage was fairly balanced.

c. MARKET STUDIES: There is no known German-specific studies on the marketing GE animals or clones.

PART H: CAPACITY BUILDING AND OUTREACH

a. ACTIVITIES: In February 2013, the USDA/FAS Office in Berlin sent German policy makers to the United States to become more familiar with U.S. commercial and regulatory practices relating to cloning and GE animals.

The USDA/FAS Office in Berlin also organized and hosted a seminar on the the impact of biotechnology on future animal breeding during the trade fair International Green Week in January 2013. The seminar was co-hosted by the Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health (FLI). Following is the text of a press release for the event:

New Animal Breeding Technologies Contribute to Food Security - Symposium at International Green Week Promotes Mutual Understanding

The symposium "The impact of biotechnology on future animal breeding" held at International Green Week in Berlin today, showed the promising prospects of new animal production technologies. In an event organized by the U.S. Department of Agriculture and the Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health (FLI), over 70 participants learned and discussed how 21st century technologies can help address global challenges associated with food security and livestock production.

World-renowned speakers discussed technological trends and practices for animal breeding in the context of future scientific developments, animal welfare, and ethical considerations. Cesare Galli, University of Bologna, presented the status of current cloning technology and Heiner Niemann, FLI, spoke on the use of biotechnology and future breeding concepts. Christel Happach-Kasan, Member of German Parliament, spoke about the regulation of future animal breeding in Europe. Mark Walton, from the firm Recombinetics, talked about the current use of animal cloning in breeding programs and its potential contribution to the development of future new technologies in animal breeding. Animal welfare, ethical issues, and societal acceptance were the focus of Jean Paul Renard, National Institute of Agricultural Research, and Peter Sandoe, University of Copenhagen.

The speakers agreed that new animal breeding technologies could make a significant

contribution to an efficient, diversified, targeted and sustainable production. However, the adoption and success of new animal breeding technologies in Europe is not certain. The degree of public concern and acceptance differs from countries in Europe to coun-tries abroad, where new animal breeding technologies have become more common in recent years.

The symposium clearly showed the importance of a discussion that incorporates the latest research developments and their benefits to society and global food security, as well as, practical commercial experience, and a discussion of how to communicate with the public. It also confirmed that the ethical standards applied are important, especially in the context of animal welfare. The symposium also recognized that agricultural production technologies will play an important role in meeting global challenges, such as population growth and a rapidly increasing demand for animal protein.

The event successfully provided a platform for open discourse on the conditions for future animal breeding. During the seminar the main characteristics of Future Animal Breeding in Germany became apparent:

- Future animal breeding technologies are a controversial topic
- GE animals is a topic that is not high on political agendas both on federal and regional level
- Consumers do not know or don't want to know the current status of animal breeding techniques (artificial insemination)
- There is no alliance or biotechnology network in Germany, which has the focus on future animal breeding techniques

b. STRATEGIES AND NEEDS: It is generally accepted that future public policy debates in Germany about animal cloning will be skewed toward personal ethical and emotional considerations. These may well overshadow a more systematic consideration of risks and benefits.