European Food Safety Authority

Presentation on the Draft Comparator Opinion

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GMO Panel

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RA strategy for GM plants and derived food/feed

Starting point - differences (intended/unintended) between GM plant and derived food and feed, and its comparator(s)

- Molecular characterisation of the modification
- Compositional, agronomic, phenotypic
- Potential adverse effects on the environment

These differ in their requirement for comparators

Comparative approach

Comparative analysis for FF risk assessment and ERA uses, simultaneously, two complementary tests:

Difference test: to assess if GM plant, apart from the introduced genetic modification(s), is different from its comparator and has potential to cause adverse effects.

Equivalence test: used in FF risk assessment to assess whether agronomic, phenotypic, compositional characteristics of the GM plant fall within the range of natural variation.

Range of natural variation is estimated from the **set of non-GM reference varieties** with a history of safe use (EFSA, 2010). (Comments on use of GM reference varieties)

EFSA current position on comparators

- The use of non-GM lines (conventional counterpart) with comparable genetic background (sexually propagated crops), or isogenic varieties (vegetatively propagated crops).

The extent to which conventional counterpart is genetically related to the GM event under assessment varies depending upon the breeding scheme used for the production of both the GM plant and its conventional counterpart.

- Parental GM lines for stacks e.g. protein expression

- Use of other comparators e.g. +/- herbicide treatments

Why is New Guidance Required

- Identifying a Conventional Counterpart

-*Increasing complexity of GM plants and breeding schemes used to derive them e.g. stacked events*

- *Increasing complexity of traits e.g. significant changes to crop composition*

- The need to evolve approaches based on good scientific principles which can keep pace with technology developments and fulfill regulatory requirements.

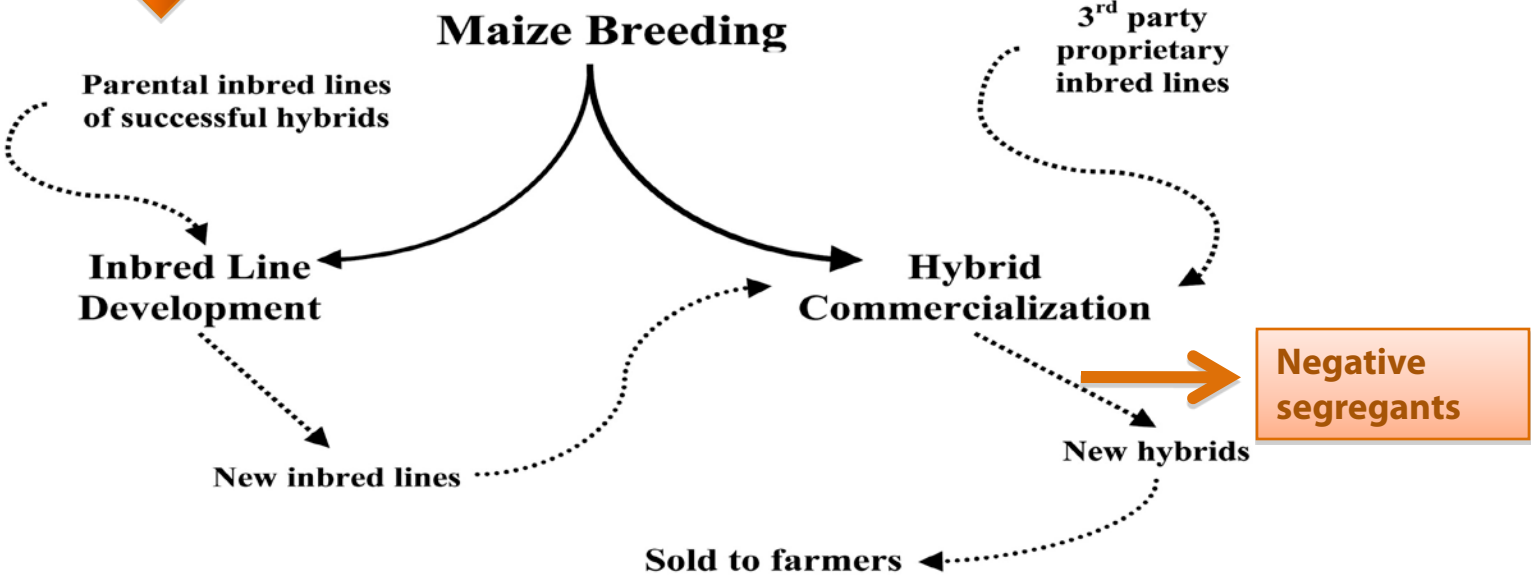
Comparators Guidance: issues addressed

- The selection of an appropriate comparator for the risk assessment of single events and stacks;
- The role of negative segregants in the risk assessment process;
- The selection of appropriate comparators in the case of stacks obtained by techniques other than conventional crossing;
- The selection of comparators in cases where the current comparative approach may not be suitable for the risk assessment of the GM plants (e.g. where major compositional changes are pursued for nutritional purposes).

Stacking: diversity of genetic backgrounds

Genotypes from Approved GM X Non-GM crosses. Events now in range of genetic backgrounds unlikely to be representative of original?

Approved events in diverse genetic backgrounds. Diverse breeding pedigrees in "3rd party" plant lines backgrounds



8 genes stacks: SmartStax (Monsanto + Dow).

Physiological/compositional modification beyond current variation

GMOs physiologically or compositionally modified beyond current known variation for the crop

Modified Polymers and Metabolites

- Enriched in Omega 3 oils
- Amino acid enriched proteins
- High amylose starch (low GI)
- Modified macro/micronutrients

Abiotic stress tolerance

Drought, salt, heat, heavy metals

Negative segregants

- Negative segregants lack the event(s) in question.

- Can be produced, for example, by self-fertilisation of hemizygous GM plants, or from crosses between hemizygous GM plants and non-GM

- Acceptable where negative segregants are derived from crosses between plants containing events which have been risk assessed and which are present within the stack being assessed.

Conventional Counterpart & alternatives

- Conventional Counterpart the preferred comparator
- Required for comparative assessment of single events
- This sets “conventional” baseline for stacks which could then use negative segregant(s) or lower level stacks for which a RA has been made.
- Equivalence test always includes appropriate non-GM reference lines
- ERA may require other non-GM comparators to address limits of concern including risk from impacts of crop management.

Definitions of comparators Food/Feed

- Regulation (EC) No 1829/2003.

  Comparator (conventional counterpart): "*similar food or feed produced without the help of genetic modification and for which there is a well-established history of safe use*".

- Codex Alimentarius (2001;2004;2009): conventional counterpart is a "*related organism/variety, its components and/or products for which there is experience of establishing safety based on common use as food*" recognising that "*for the foreseeable future, foods derived from modern biotechnology will not be used as conventional counterparts*".

Codex Task Force Report
March 2001

- Several delegations stated- once food derived from biotechnology approved and in common use for an extended period- no scientific reason for not using such a food as the basis for comparison.

- Other delegations –confidence of consumers in "biotech" foods depended on association of their safety with non-GM foods with well-established history of safe use. Traditional unmodified food- sound baseline.

- "At the present time and for the foreseeable future, foods derived from biotechnology could not be considered as meeting this criterion (2001).

Definitions- meeting requirements

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Environmental Risk Assessment (ERA)

- Directive 2001/18/EC:

"identified characteristics of the GMO and its use which have the potential to cause adverse effects should be compared to those presented by the non-modified organisms from which it is derived and its use under corresponding situations".

"Information from releases of similar organism and organisms with similar traits and their interaction with similar environments can assist the ERA".

Summary

- Introduce flexibility in selection of comparators based on sound biological principles
- Align comparators with evolving FF and ERA Guidance documents
- Compliance with definitions -current legislative requirements
- Continue to evolve guidance based on further developments with the technology

Public consultation

- Public consultation on draft guidance 15th November 2010 - 15th January 2011 for public consultation.
- EFSA received 139 submissions, from 18 stakeholders.
- Table of all received comments together with a summarized response to the most relevant ones is published on the EFSA website http://www.efsa.europa.eu.
- Draft opinion to be modified following consultation exercise and stakeholder workshop