Presentation to ICO/PSCB
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Works on coffee
by the
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Chair of sub-committee TC34/SC15

ISO stands for
International Organization for Standardization
with headquarters in Geneva, Switzerland

ISO has a membership of
156 national Standards Institutes

ISO develops voluntary technical standards,
which add value to all type of business operations

In the economical dimension, ISO standards promote:
• efficiency and effectiveness
• facilitation of trade
• dissemination of new technologies

A large part of ISO standards are aimed to be used as
tools for qualifying product authenticity and quality

The objective is to end with simple-to-use standards
in order to allow good and repeatable
classification of products (coffee, in our case)

ISO vocation is developing standards
that provide the link between:
• creative potential (great ideas)
• tackling problems (practical implementation)

ISO develops only those standards
that are requested by the market

This work is carried out by experts coming from
those industrial, technical and business sectors
that have asked for the standards,
and which subsequently put them to use

These experts may be joined by others
with relevant knowledge, such as representatives of:
• government agencies
• consumer organizations
• academia
• testing laboratories
ISO sub-committee dedicated to coffee (TC34/SC15) is at present animated by 20 participating members among which the most active are:
- Brazil, Colombia, France, Germany, Cuba

The secretariat is held by the Brazilian national body ABNT

22 coffee standards have been published so far

Three main axes are currently under discussion:
- vocabulary
- water content
- defects

The word “coffee” is a multi-faceted one

ISO standard 3509:2005 covers several, but not all, of its meanings

“Coffee” is seen by trade and industry mainly as:
- a tree
- an agricultural product
- a traded commodity
- a roasted product off-the-shelf

Consumers and media world do refer to “coffee” mainly as a beverage, ready for consumption, often evoking ritual and social behaviours

ISO Standard 3509, even in its recent revision of 2005, does not cover any step after “grinding”

This lack of definitions frustrates attempts to classify beverage consumptions trends, both in their traditional and more modern aspects

A new working group, led by France, has been created to study the global situation and to propose redefinitions and integrations

The word “water” too is a multi-faceted one

ISO standards cover some, but not all, of its meanings

Trade and industry mainly see “water” as either:
- a foreign material present in raw coffee, bought as coffee and therefore affecting coffee price
- a spoilage factor of raw coffee at field and transport, enhancing mould attack opportunities and eventually leading to lot rejection
- a spoilage factor of raw coffee during final storage, leading to enzymatic reactions that produce off-tastes in the long term
- a roasting/quenching/packaging technological aid, sold as coffee in the finished product off-the-shelf
Each of these contexts deserves a precise definition of what is meant by “water”, in order to build a method of analysis able to address the real problem and to produce the desired effect. The four practical problems introduced in the foreword should be tackled separately, by carefully determining the appropriate “water” species. Existing ISO standards ISO 1446:2001; ISO 6673:2003 and the Karl-Fischer-related ones do cover the field up to a point, but more attention is to be paid to developments in analytical technology.

The first item affects roasting yield, i.e. the mass of R&G coffee that can be eventually sold. It sounds logical that an analysis that mimics the roasting process could be appropriate. It is well known that mould attack can be prevented by keeping “water activity” (aW) low. No ISO standard covers this aspect so far. The production of off-tastes in the long term storage is a poorly understood and little investigated phenomenon. It seems proper it is left to attention of academic research. Any thermal analysis of roasted coffee products is prone to the error of determining volatile species other than H2O as water (e.g. CO2).

To the present scientific knowledge, at least the following five physico-chemical statuses of H2O exist:

- **Superficial water**: pure H2O in open spaces
- **Capillary water**: pure H2O in narrow channels
- **Osmotic water**: H2O with solutes, either ionic or molecular
- **Imbibition water**: H2O chemically bond by adsorption
- **Crystallization water**: H2O chemically indispensable for the intimate structure of various compounds, unremovable

A working group to look into this topic is foreseen.

The term “coffee defect” is quite difficult to be defined unambiguously. Several dissimilar approaches are ruling the trade in different countries, with little coherence or coordination, if any. ISO has started to deal with the topic more than twenty years ago. A first agreed Standard was published in 1993. Submitted to thorough revision, it was re-issued in 2004. As per the present day, ISO standard 10470:2004 is final and in force.
Obviously enough, application of ISO 10470 is by no means mandatory, but completely voluntary. If adopted by the main Boards of Trade and introduced in international contracts, ISO 10470 could prevent dissimilar approaches in different countries, improve coherence and mutual understanding, and limit litigations by the parties. Last but not least, it could set the basis for enhancement of quality in the spirit of ICO resolution 420 (Coffee Quality Improvement Programme).

Main innovative features of ISO 10470:2004 are:

- unification of descriptors in both Arabicas and Robustas
- weighing criterion, as opposed to defect count
- subdivision of defects in five categories:
  - non-coffee defect
  - defect of non-bean origin
  - irregularly formed bean
  - bean of irregular visual appearance
  - off-taste coffee

Another significant novel feature is the attribution to each defect of two different coefficients likely to affect product value:

- loss of mass: effect of the feasible sorting out of relevant defects on the amount of coffee left in the lot (e.g. stones are unlikely to be allowed to roast!)
- sensorial concern: impairment suffered by the quality of final roasted product, should the relevant defect be allowed to remain in the lot.
Apart from the description of defects, ISO 10470 offers a non-normative example of utilization, which could be adjusted by different contracts to suit as well as possible own economic clauses.

Such an hypothetical example of application leads to establishing “Quality Impact Units”. It would ideally allow the negotiating parties to agree on quantification of the commercial value of a lot.

In the frame of ISO five-year term revision policy, standard 10470:2005 will be revised to acknowledge any new exigencies called for by the profession. Participation to ISO works of exacting professionals from all stakeholders is crucial to this purpose.

The importance of coffee business, the second major money-spinner around the world, cannot be neglected.

The International Organization for Standardization feels bond to serve the needs of such a world.

So far, a considerable amount of time and gray matter has been invested by coffee producers, industry and trade to ask ISO to put transparency and sound science in it.

More resources are needed to continue and fulfill the demands for tools that make a difference.

All helping hands are more than welcome to join this effort and make their voices heard in our fully international and open-minded forum.

COFFEE DEFECTS

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CONCLUSIONS

Hypothetical example

<table>
<thead>
<tr>
<th>Defect</th>
<th>Mass g</th>
<th>%</th>
<th>Coefficient 1</th>
<th>Coefficient 2</th>
<th>Actual Coefficient 1</th>
<th>Actual Coefficient 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stones 1.2</td>
<td>0.4</td>
<td>1.0</td>
<td>0.4</td>
<td>0</td>
<td>0.4</td>
<td>0</td>
</tr>
<tr>
<td>Beans in parchment 3.0</td>
<td>1.0</td>
<td>0.5</td>
<td>0.5</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>Black beans 3.0</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Immature beans 10.5</td>
<td>3.5</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Spongy beans 9.0</td>
<td>3.0</td>
<td>1.0</td>
<td>3</td>
<td>0.5</td>
<td>3</td>
<td>0.5</td>
</tr>
<tr>
<td>Brown beans 7.5</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Sound beans 265.8</td>
<td>88.6</td>
<td>100.0</td>
<td>3.9</td>
<td>8.75</td>
<td>3.9</td>
<td>8.75</td>
</tr>
<tr>
<td>TOTAL</td>
<td>300.0</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This procedure can be applied to any contract of purchase of green coffee that may be negotiated between provider and client. For (a) certain defect(s), the contract may impose either a maximum mass fraction in percent or a maximum value of “Quality Impact Units”. Such limits may be defined in advance between the negotiating parties.