High-level Summary

Consultative workshop on "bottling practices – consultative workshop for producers of essential and vegetable oils in South Africa"

28 November, 2023, Teams, 14:00 – 15:40

Introduction

The essential and vegetable oil producers were invited to an on-line consultative workshop which focused on obtaining insights into how the producers, irrespective of the amount of oil that is produced, transfer the bulk oil processed either by distillation or by cold pressing into smaller containers for selling. To demonstrate compliance to pe-packaging requirements, it is important to be able to know whether you are under-filling a container or overfilling a container as both have cost implications. The workshop was attended by 39 participants.

Background

- Dr. Elsie Meintjies, Chief Technical Advisor (GQSP-SA) shared a brief recap on what we have done with legal metrology so far in terms of the Global Quality and Standards Program South Africa (GQSP-SA) and in phase one, an assessment was done for 2 essential and vegetable oil producers as to how they comply with the legal metrology and the prepackaging requirements.
- The assessment was done by the legal metrology unit of the National Regulator of Compulsory specifications (NRCS).
- Based on that, an online training webinar on marking and accuracy requirements for prepackages under the Legal Metrology control was prepared and a detailed guide for the industry and it's specifics for this industry right for the essential and vegetable oils industry was also released. The guide can be accessed online on both the UNIDO and SAEOPA websites.
- The GQSP-SA project is partnering with the Legal Metrology Unit of the NRCS as they are the custodians of the regulations pertaining to trade and the project is also partnering with SAEOPA, the business support organization and industry association through which we are implementing the project.
- Ms. Karen Swanepoel, SAEOPA Executive Director, noted that since a lot of oil is lost through the bottling process, we wish to address this issue with the support of the GQSP-SA project and the Legal Metrology Unit of the NRCS. She noted further that efficient bottling and labeling have been identified as possible processes for improvement and to prevent this loss of profit.

Topics covered in the consultative workshop

The participants were invited to contribute to a rich industry information exchange on methods currently used for bottling or packaging under the following sub- topics and the raw data from inputs received is given below:

I. **The typical size of the container e.g., 10, 20, 50, 100 ml or more?**

- **10 ml, 1 kg, 4,5 kg, 21 kg**
- **25 L drums aluminum or SS, plastic for seed oil**
- **50 ml, 100 ml, glass 1L, 20 kg HDPE plastic**
- **Clients are difficult, glass, 10 ml cost effective, glass varies in thickness, evaporation, bigger quantity over 1 L measured in kg**
- **10ml, 15 ml, 30 ml, 100 ml, glass 20 l aluminum bigger drums**

II. **What equipment is used to do the transfer?**

a. **Decant, pipette, burette, volumetric flask, syringe (plastic/glass), automatic fill using technology etc.**

- **10 ml dispenser - bottle top dispenser (Masiye labs)**
- **system to be designed for specific measurements**
- **Direct titration into plastic holder, have to take into account 2 kg, plastic syringe/ pipette is used**
- **Measuring cylinder used to fill glass bottles, have to fill to cosmetic fill**
- **Lab scale, glass syringe, pipette not used for heavy oils, syringe for heavy oil, big drums a funnel is used.**

III. **What precautions are taken to neither over- or under-fill the container etc.**

- **Scale, Tare bottle**
- **scale to be calibrated, scale, density set to lab, internal use glass and weight.**
- **Markings on syringes**
- **Automatic filling machines**
- **lab scale, accurate enough to determine tolerance is correct**

IV. **What are the typical challenges experienced whilst transferring the oil from the distillation/cold pressing unit to the smaller containers?**

- **tops and bottles not same material, essential oil will react with seal**
- **Spillage, 20 kg into smaller packages**
- **Viscous liquids difficult to fill**

V. **Is there anything that we have missed?**

- **density of material gen give accurate mass, volume think the customer rely on density of product, expansion for diesel and petrol, economical??**
- **operation procedure**

- **used density and compared it with general mass with color, heavier what is element difference?**
- **density is not only measure of purity, but there is also full analysis done on oil, GCS analysis of purity. Small bottle is ml depends who is client. Bulk oil clients want irrespective of volume. Clients in store want in ml.**
- **shape of container?**

Recap by the Legal Metrology Unit of the NRCS

- If we look at the typical containers it looks like for small volumes we are looking at 10, 15, 100 mL glass.
- Anything larger than that looks like being plastic containers or then stainless steel or aluminum drums.
- Consider looking at giving guidance on plastic for larger containers and inputs on the equipment used for filling (diverse range of equipment).
- Possibility of bottle top dispensers, the translation from bulk into the smaller containers and then also using syringes and pipettes also measuring cylinders to fill from a larger container into small container and then also using a lab scale for the measurement.
- Ensuring that the scale that is used to check is calibrated, when filling the containers and if it's filled that the containers are tied and the tail of that container is taken into consideration.
- Trusting the markings of the syringes, and comparing it with a lab scale to make sure and also indication that it might be good to use an automatic filling machine because they take into consideration all of the requirements to ensure that the average is correct.
- Looking at typical challenges, there was some indication of the bottles and the lids not being the same material and even the seals that is of a specific plastic that might be problematic.
- Then also spillages from bigger to smaller containers and then also some indication of the viscosity of certain of these oils, that makes it difficult to measure from bulk into smaller containers. So that is definitely a consideration that we will have to take into consideration when developing methods or looking at equipment then.
- Safe working procedures for measuring equipment. There were questions about is there safe working procedures or generally ensuring that an instrument or measuring instrument is accurate. So we can definitely look at those procedures.
- Smaller capacities use volume measurement and the larger capacities use kilogram, having implications on the density and the purity of the product. It is a subject we can further look into.
- Looking at the measures or ways that a manufacturer can determine his own density on equipment could be beneficial.
- Looking at different containers, maybe with a longer and a narrower neck to protect the product in that way, and then also maybe leading to it easier being full to a certain level and if you fill it in that long neck, the difference is not a big volume like in a 10 mL or a 30 mL dropper bottle.
- We found that the plastic 1 L, 5 L and 25 L containers are not always the same shape.
- Automatic filling machines: important to make sure that it is cleaned thoroughly in order to prevent contamination.

- Guidance on HDPE plastic containers for essential oils shared. It is important to make sure that these are fluorinated so as to prevent the essential oils from deteriorating the plastic, aluminum or food grade drums are preferred for exporting.
- The plastic containers work best as the metal containers are being damaged by the couriers and we found it more expensive for the local market, but it is always important to remember to use the right packaging for your own material.
- Use nitrogen from a secured nitrogen gas cylinder at a very low flow rate to bubble into the oil for about 5 minutes.
- Most put 20 kg oil in 25 L containers for expansion and movement of the oil.

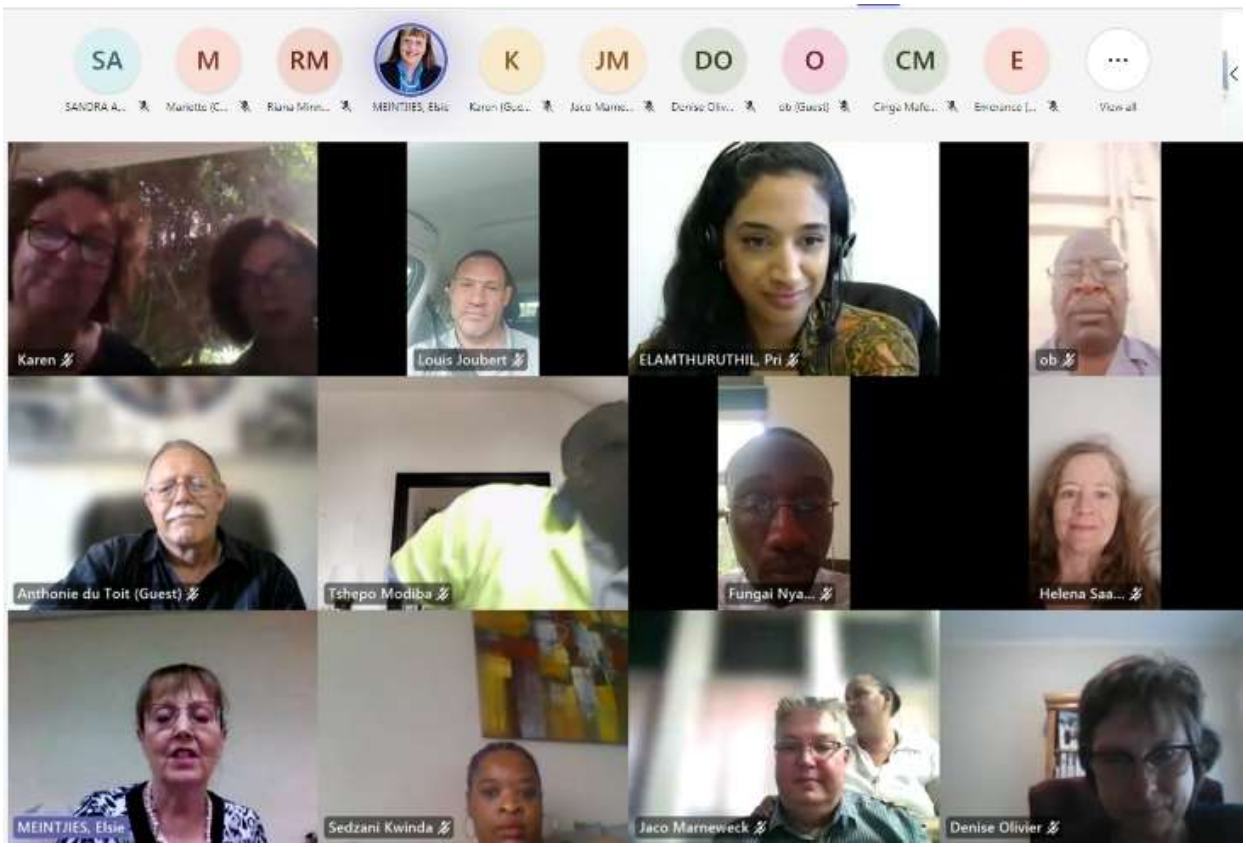
Other topics and tips received, which could be further incorporated in the SOP guide are as follows:

1. Shelf life of essential oils and issue of evaporation
2. The product should not be spoiled on the shelf
3. Density of seed oils and the challenges when it comes to pouring them
4. In addition to the automatic filling machines are not enough, there needs to be someone doing the quality control before the bottles are capped
5. Thickness of the bottle bottom
6. Litres versus kilograms when measuring and the need for a calibrated scale for larger volumes

Conclusion

Thanks to the active participation of the industry, the organizers of the webinar (the NRCS, the legal metrology unit, the GQSP and SAEOPA) were able to gather valuable information that shall eventually go into a standard operating procedure for the industry as to how to bottle effectively and efficiently in line with the legal metrology requirements. With the experiences shared during the webinar, the NRCS and the GQSP project in collaboration with SAEOPA will be able to further determine what measurements are appropriate for SMEs to demonstrate compliance with the prepackaging requirements and how to best identify and specify the type of equipment necessary.

Group Photo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