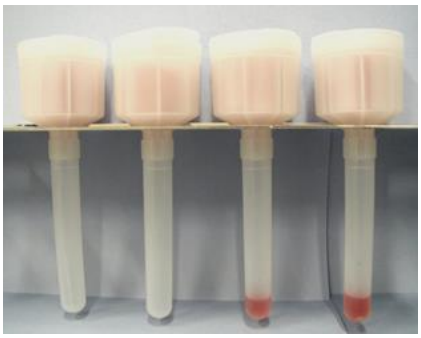
DANISH MEAT
RESEARCH INSTITUTE

Manual
Instruction manual for EZ-DripLoss

4 May 2020
Init. MTDE/LOBG/MT



DMRI has developed a gravimetric method – EZ-DripLoss – for determination of drip loss in pork. The robust and well-documented method is sensitive to variations in the meat quality and consequently suitable for quantifying meat quality.
In this paper, instructions and guidelines are presented for the method.

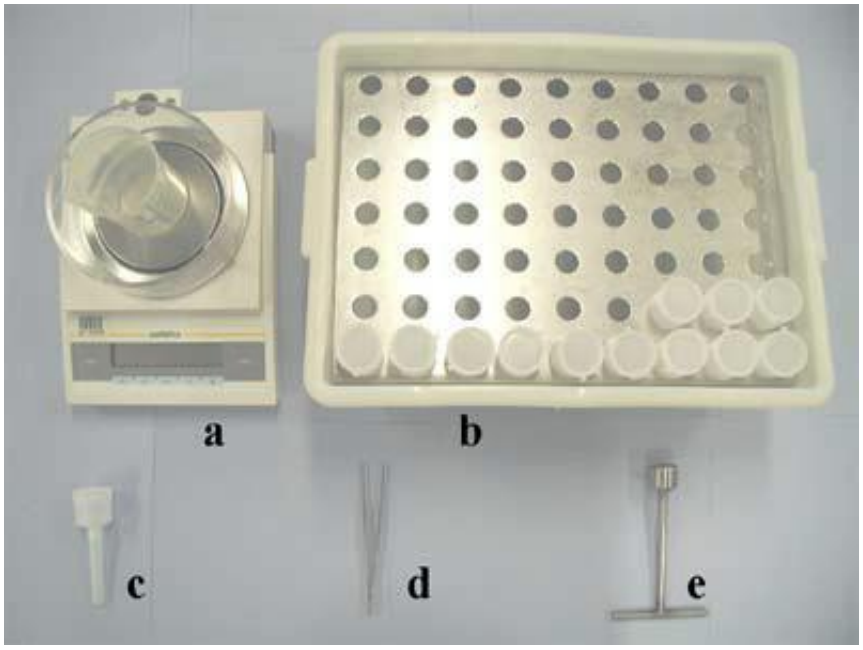
EZ-DripLoss has been documented for *method and precision* in loins (*Longissimus dorsi*) of equalized carcasses approx. 20-24 hours after sticking [1], and EZ-DripLoss has proven to be robust regarding:

- Operator – two operators
- Sample size – difference between sizes of approx. 30%
- Duration of storage – within 24 ± 4 hours
- Storage temperature – between 3 and 9°C
- Transport – two hours simulated transport at 4-5°C

For silverside (*Biceps femoris*), the EZ-DripLoss method was documented [2] as being robust (two operators and two sample points at the silverside) with a reliability of 78% at a double determination per sample.

The drip loss depends on the point in the process where the sample is made and the period after sticking. To compare results from previous tests, the point in the process where the sampling was made must be specified – from the suspended carcass in the cold storage or from parts/cuts from cutting or deboning.

Equipment



a) Chemical scale with 3 decimals 0.001 g – uncertainty of measurement for the weight ± 0.50 mg.
   Beaker glass
b) Plastic box with holder for EZ-DripLoss containers
c) EZ-DripLoss containers
d) Tweezers
e) EZ-DripLoss circular knife (Ø 25 mm x 20 mm height)

Furthermore, an EZ-DripLoss spreadsheet is used for recording data. See Appendix 1.

Practical information

You can order EZ-DripLoss containers and circular knife (Ø 25 mm x 20 mm height) online at Danish Technological Institute, DMRI:
https://www.dti.dk/specialists/driploss-equipment/35497

The EZ-DripLoss containers are only to be used once, and the meat samples are not for fresh consumption but must be destroyed after the measurement has taken place.

Preparation of EZ-DripLoss containers

Marking and tare weight for each EZ-DripLoss container are recorded before sample preparation. Samples from each muscle are always made for double determination. This means that two empty EZ-DripLoss containers must be marked and weighted for each muscle for sampling.

The containers for loin samples always end at 1 and 2. The containers for silverside samples always end at 3 and 4.

The containers for loin samples are marked with consecutive numbering at the lid:
Container no. 1: 1.1 and 1.2
Container no. 2: 2.1 and 2.2
Container no. 3: 3.1 and 3.2
etc.

The containers for silverside samples are marked with consecutive numbering at the lid:
Container no. 1: 1.3 and 1.4
Container no. 2: 2.3 and 2.4
Container no. 3: 3.3 and 3.4
etc.

After marking, the containers are weighted, and the values of the tare weight are recorded in the EZ-DripLoss spreadsheet.

Loin samples are recorded in the divider sheet "LOIN" in the columns "Container 1 empty" and "Container 2 empty".

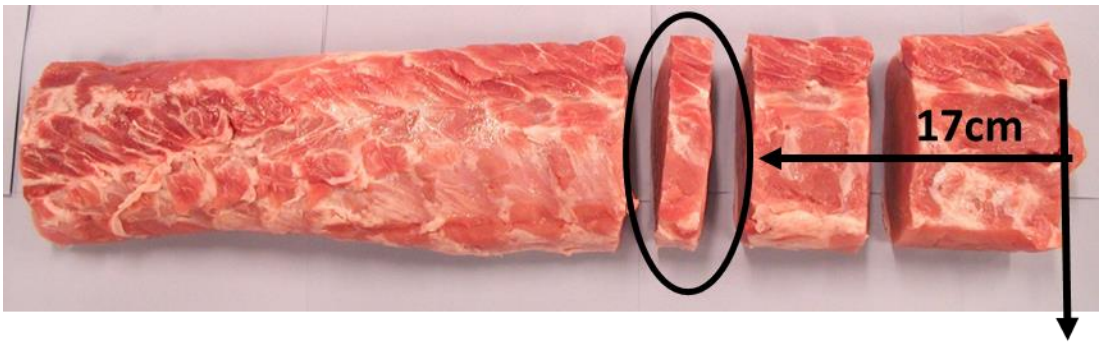
Silverside samples are recorded in the divider sheet "SILVERSIDE" in the columns "Container 3 empty" and "Container 4 empty".

The plastic boxes with the EZ-DripLoss containers are placed at 4-5°C the day before sampling.

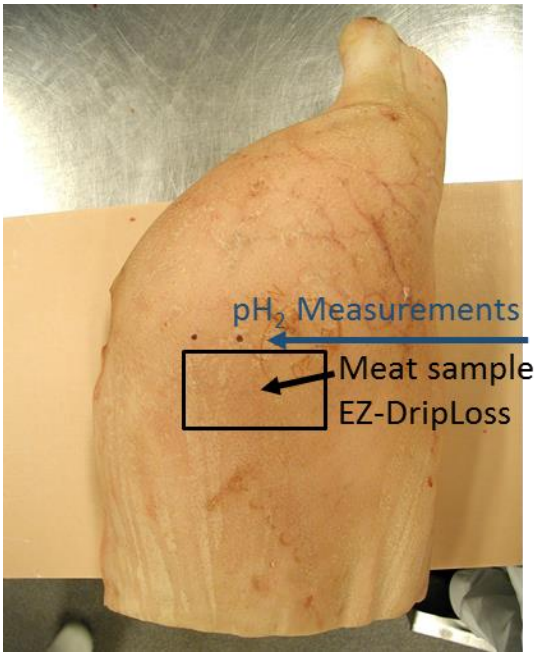
Meat sampling for EZ-DripLoss




EZ-DripLoss meat sampling of the suspended carcass is carried out on the left side by cutting a slice of 20 mm thickness opposite to the 5th posterior lumbar vertebra.



EZ-DripLoss meat sampling of a loin product is carried out by cutting a slice of 20 mm thickness opposite to the 5th posterior lumbar vertebra (oval circle). Measured approx. 17 cm from the rear edge of the hip (arrow at the image).

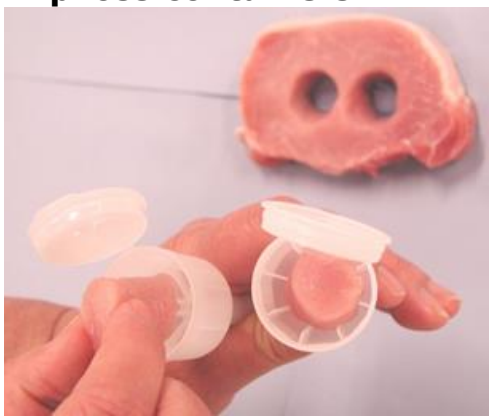


EZ-DripLoss meat sampling of silverside is carried out on the left side of the carcass by cutting a slice of approx. 9 X 7 cm from the flat area of the silverside. Measured horizontally from the highest point of the pubic bone 13 cm from the edge of the rind by the tail head. A slice of 20 mm thickness is ***cut crosswise of the muscle fibres*** for determination of EZ-DripLoss.

Boring of meat samples, placing the EZ-DripLoss containers

Two samples for EZ-DripLoss are ***bored in the fibre direction*** in the middle of the piece of meat with a Ø 25 mm circular knife (the picture shows loin).

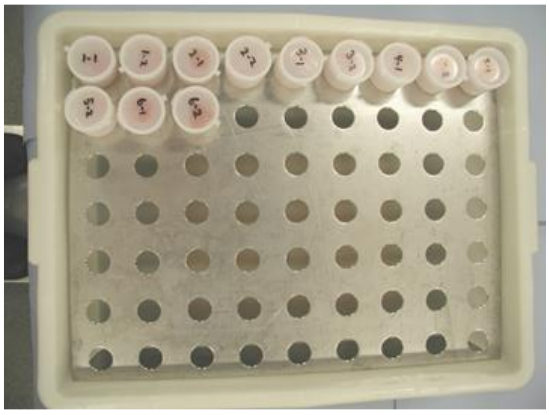
The animal number or the code of the meat sample is recorded in the EZ-DripLoss spreadsheet in the column ”Animal/Code”.



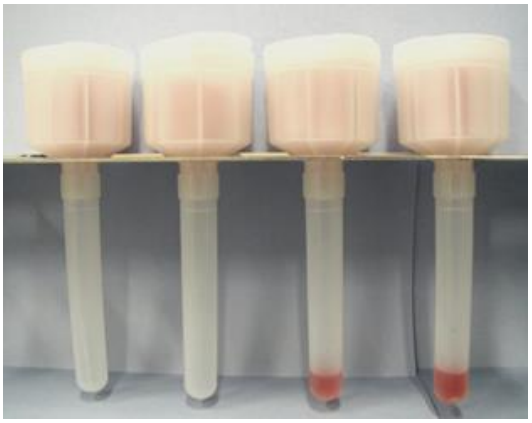
The EZ-DripLoss samples are placed in ***vertical fibre direction*** in the containers.

When the lid is closed, the sample must not come into contact with the lid.

The time for start and finish of sampling is recorded.



The EZ-DripLoss containers are placed in the holder in the plastic box in the order they have been sampled. Then the EZ-DripLoss samples are kept at 4-6°C for 24 hours.



Example of EZ-DripLoss after 24 hours at 4-6°C.

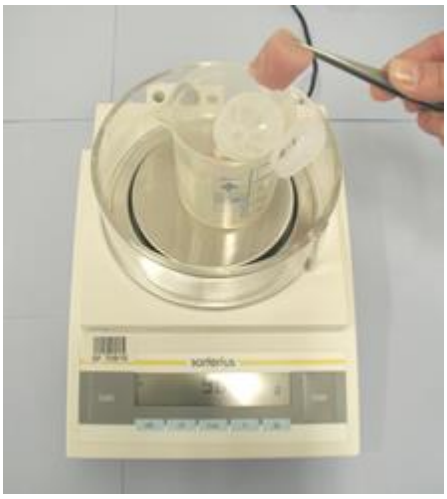
Weighing after 24 hours

The containers are weighted on a chemical scale with 3 decimals, and the weighings are recorded with 3 decimals in the EZ-DripLoss spreadsheet.

At first, the weight of the EZ-DripLoss container with meat and juice is measured.

The weight is recorded in the divider sheet LOIN in column "Container 1 + sample + meat juice". Correspondingly the weight of "Container 2 + sample + meat juice".

The same procedure for recording in the divider sheet of the SILVERSIDE.



The meat sample is removed from the EZ-DripLoss container.

The weight of the EZ-DripLoss container with juice is measured.

The weight is recorded in the divider sheet LOIN in column "Container 1 + meat juice". Correspondingly the weight of "Container 2 + meat juice".

Same procedure for recording in the divider sheet of the SILVERSIDE.

Calculation of EZ-DripLoss

Calculation of EZ-DripLoss:

$$EZ - DripLoss = \frac{(W_l - W_c) * 100}{(W_t - W_c)}$$

Where:

- W_c is the weight of the empty EZ-DripLoss container
- W_t is the weight of the EZ-DripLoss container with meat and juice
- W_l is the weight of the EZ-DripLoss container with juice

References

[1] Oksama, M. (2004) DMRI, Robusthedstest for EZ-DripLoss-metoden i kam.
Rapport, Ref.nr.: 02701 – dokument nr.: 23714.1. (Test of robustness for the EZ-DripLoss method in loin)

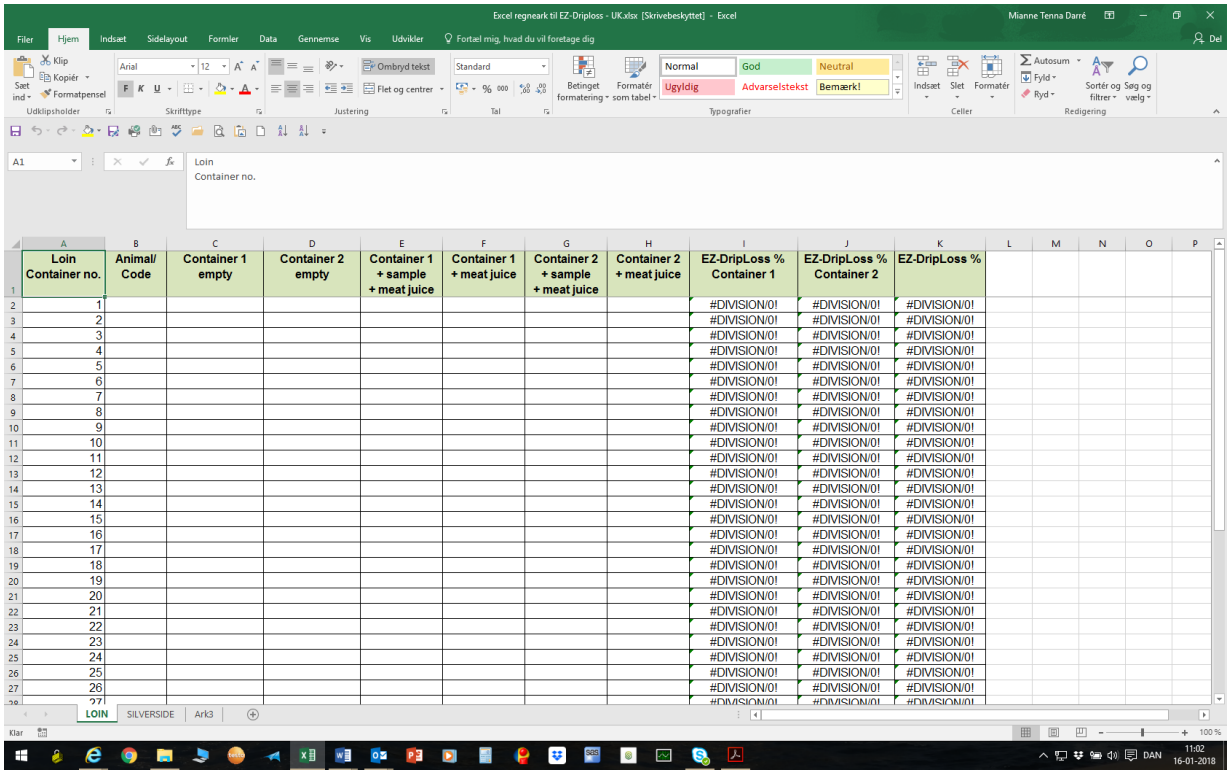
[2] Oksama, M. (2004) DMRI, Dokumentation af EZ-DripLoss i yderlår.
Rapport, Ref.nr.: 02701 dokument nr.: 23711.1. (Documentation of EZ-DripLoss in silverside)

G. Otto et al. *Meat Science, 68 (2004) 401-409*. Comparison of different methods for determination of drip loss and their relationships to meat quality and carcass characteristics in pigs.

Lars Bager Christensen. *Meat Science, 63 (2003) 469-477*. Drip loss sampling in porcine m. longissimus dorsi.

Rasmussen, A. & Andersson, M. (1996) New method for determination of drip loss in pork muscles. In: Hildrum, K.I. (ed.) *Meat for the consumer. Poster Proceedings of the 42nd International Congress of Meat Science and Technology.* Lillehammer, Norway, 286-287

Appendix 1



Loin Container no.	Animal/ Code	Container 1 empty	Container 2 empty	Container 1 + sample + meat juice	Container 1 + meat juice	Container 2 + sample + meat juice	Container 2 + meat juice	EZ-DripLoss % Container 1	EZ-DripLoss % Container 2	EZ-DripLoss %
1								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
2								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
3								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
4								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
5								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
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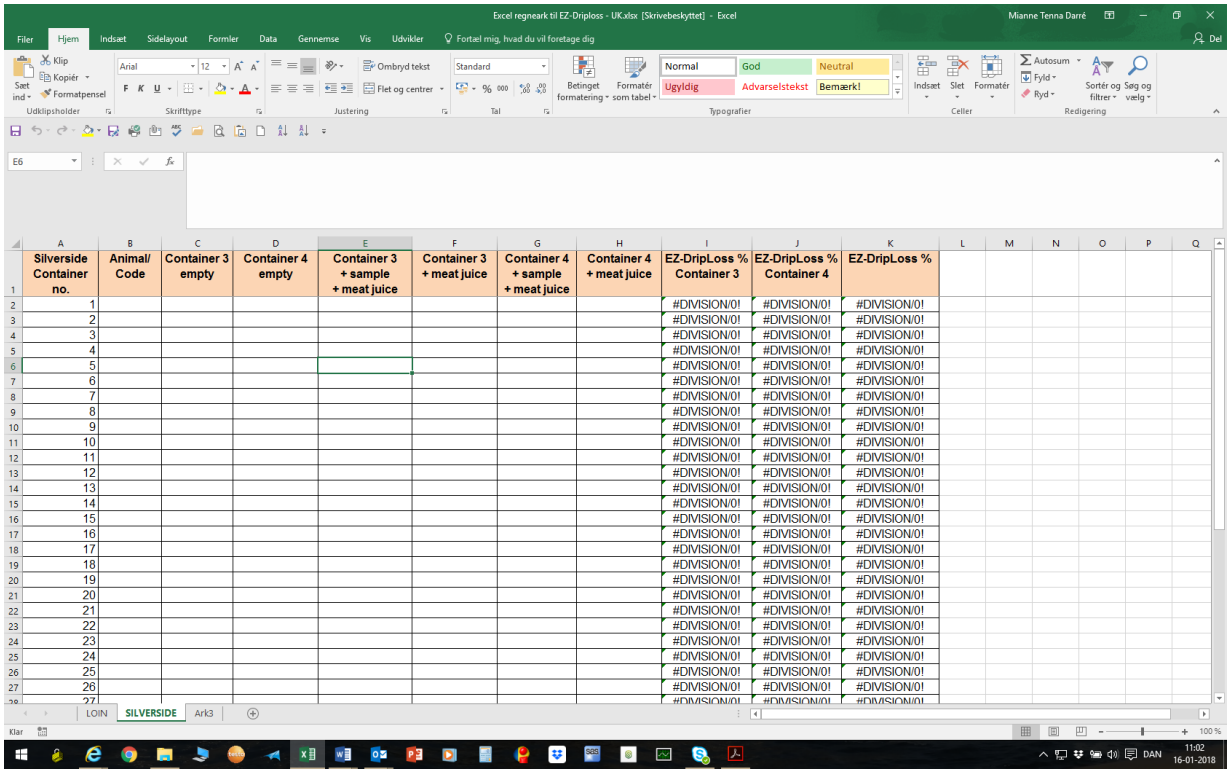

Silverside Container no.	Animal/ Code	Container 3 empty	Container 4 empty	Container 3 + sample + meat juice	Container 3 + meat juice	Container 4 + sample + meat juice	Container 4 + meat juice	EZ-DripLoss % Container 3	EZ-DripLoss % Container 4	EZ-DripLoss %
1								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
2								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
3								#DIVISION/0!	#DIVISION/0!	#DIVISION/0!
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