大豆热损成因及其减损措施的一点思考

宣讲人：黄波

天津天衡海事检验有限公司

争议焦点

- 装港大豆含水量超过国标1%，是否是大豆发生热损的原因；
- 散货船装载大豆，货舱测温和通风是否可行

- **品质报告书**

FORM FOR CARGO INFORMATION
for Solid Bulk Cargoes

BCSN

Shipper **LOUIS DREYFUS COMPANY BRASIL S.A.**	Transport document number:
Consignee **TO ORDER**	Carrier
Name/means of transport Vessel: **M/V YASA UNITY** Port/place of departure: **PARANAGUA, BRAZIL**	Instructions c **ACCORDI** **RECOM** **THE C** **DURI**
Port/place of destination: **CHINA PORT(S)**	
General description of the cargo (Type of material/particle size)* **BRAZILIAN SOYBEANS, IN BULK** *For solid bulk cargo	Gross m ent.
Specifications of bulk cargo, if applicable: Stowage factor: **48 cu ft per mt** Angle of repose, if applicable: **25 º** Trimming procedures: **NOT APLICATED** Chemical properties if potential hazard*: **NOT APLICATED** * e.g., Class & UN No. or .MHB.	
Group of the cargo Group A and B* Group A* Group B [X] Group C The cargo is not harmful to the marine environment.	Transportable moisture limit **MAX 14,00%** Moisture content at shipment **MAX 12,80 %**
Relevant special properties of the cargo No special hazard This cargo is non combustible and has low fire risk.	Additional certificate(s)* [X] Certificate of moisture content and transportable moisture limit Weathering certificate Exemption certificate Other (specify) * Ifrequired
DECLARATION I hereby declare that the consignment is fully and accurately described and that the given test results and other specifications are correct to the best of my knowledge and belief and can be considered as representative for the cargo to be loaded.	**Schutter do Brasil Ltda** *As First Class Surveyor* Paranagua, abril 3, 2018

Transportable moisture limit
MAX 14,00%

Moisture content at shipment
MAX 12,80 %

MAPA（巴西标准） 大豆含水量 ≤ 14%
国标 GB1352-2009 大豆含水量 ≤ 13%

我们认为大豆发生热损的原因复杂，仅仅将含水量高一个百分点，作为大豆热损的成因可能是一个伪命题。

- 检验委托

取样标准高于FOSFA检验标准，以5000吨为一个检验批次，每个批次取样60次，产生一份60公斤的集样。

F8325S MV YASA UNITY Sampling Protocol for Tianjin, China

Dear Capt Huang Bo,

Please find draft sampling instructions for the YASA UNITY below. I understand that these may be updated depending on the method of discharge and whether access to the conveyor is possible. We therefore provide the following as general guidelines which may be amended accordingly, though the frequency of sampling should remain the same.

The number of composite samples to be produced will also depend on whether it is carried out as a joint exercise with other parties.

Representative Sampling of Holds 1 – 7 According to FOSFA Sampling Rules

The total consignment size is 63,135.940 mt.

Please sample all holds in 5,000 mt lots according to FOSFA Sampling Rules. **For each 5,000 mt lot, 60 incremental samples should be taken to produce a 60 kg bulk sample.** Thus, each incremental sample should be 1 kg in weight and taken at regular intervals during discharge, ideally from a point at which the grain is flowing. If it is more convenient to sample at a higher frequency, please do so and make a note of the frequency. In any case, the frequency of sampling should be consistent throughout discharge.

Each bulk sample should be stored in a large thick bag, clearly labelled to show what it represents (e.g. "LOT 1 Bulk Sample [0 – 5,000 mt], MV YASA UNITY at Tianjin on xx/xx/2018") and sealed when not in use.

- 卸货—取样过程

- 混样-制样过程

LETTER OF PROTEST REGARDING MOISTURE CONTENT OF CARGO

VESSEL : M/V YASA UNITY
DATE : 05.04.2018
PORT : PARANAGUA / BRAZIL
CARGO : SOYA BEAN IN BULK

TO : SHIPPERS
CC : ALPHAMAR AGENCIA MARITIMA
CC : PAN OCEAN CO. LTD.
CC : YASA SHIPMANAGEMENT AND TRADING S.A.

TO WHOM IT MAY CONCERN

DEAR SIRS,

I, UNDERSIGNED AS THE MASTER OF M/V YASA UNITY, KINDLY INFORM YOU THAT MY VESSEL ARRIVED TO PARANAGUA ROAD ON 20/03/2018 AT 05:20 LT (08:20 UTC), AND BERTHED TO EXPORT CORRIDOR – NO: 213 ON 04/04/2018 AT 19:50 LT (22:50 UTC).

IN "PRE-ANALISIS DECLARATION", WHICH HAS BEEN DELIVERED BY AGENT, THE MOISTURE CONTENT (MC) OF CARGO IS DECLARED AS "14 % MAX". WE MEASURED CARGO TEMPERATURE AS ABOUT 28 C DEG. AND WHEN WE CONSIDER THE LONG VOYAGE DURATION TO CHINA, WE EVALUATE THAT MC IS EXCEEDING THE ACCEPTABLE LIMITS FOR SAFE CARRIAGE OF SOYA BEAN AND MAY CAUSE TO CARGO DAMAGE.

WE HEREBY PROTEST THE ABOVE MENTIONED SITUATION, REQUEST LOADING CARGO WHITIN THE ACCEPTABLE LIMITS, AND INFORM YOU THAT WE DO NOT ACCEPT ANY CLAIM / DELAY / EXPENSE FOR AND ON BEHALF OF MY VESSEL / OWNER / MANAGER / CHARTERERS AND MAY EXTEND MY PROTEST WHENEVER AND WHEREVER CONVENIENT. I HEREBY HOLD YOU FULLY RESPONSIBLE FOR ANY CLAIM INCLUDING BUT NOT LIMITED TO CARGO DAMAGE CLAIMS, TIME LOST, DELAYS AND COSTS WHATSOEVER AND HOWSOEVER CONSEQUENCES WHICH MAY ARISE THEREOF.

PLEASE SEE PRE-ANALISIS DECLARATION AS ATTACHMENT.

YOURS FAITHFULLY,

MASTER OF MV YASA UNITY
CAPT.EJDER YILDIZ

M/V YASA UNITY
MAJURO

- 抗议信

- 装港大豆取样

- 一份符合巴西标准的大豆品质报告并不意味着船上每一粒大豆都符合巴西标准
- 舱内可能既有低于标准的大豆，也有高于标准的大豆，这取决于发货人自己购买和存储大豆的实际情况。
- 如果发货人囤积了不符合巴西标准的大豆，就可能设法在严格把控巴西标准的情况下，尽可能的将这些超标的豆子混入舱内。

Art. 16. The technically recommended moisture percentage for commercial purposes of soybeans will be 13.0% (thirteen percent).

CAPÍTULO III

DOS REQUISITOS E DOS PROCEDIMENTOS GERAIS

Art. 13. A soja deverá se apresentar fisiologicamente desenvolvida, sã, limpa e seca, respeitadas as tolerâncias estabelecidas nesta Portaria.

Art. 14. Os limites e procedimentos a serem adotados quando da verificação da presença de partículas com toxicidade desconhecida observarão o estabelecido em legislação complementar.

Art. 15. Os grãos ou sementes de outras espécies vegetais presentes na amostra deverão ser identificados e quantificados, observado referencial fotográfico disponibilizado pelo Ministério da Agricultura, Pecuária e Abastecimento.

Art. 16. O percentual de umidade tecnicamente recomendado para fins de comercialização da soja será de 13,0% (treze por cento).

- 巴西标准修改

- 大豆的自然发酵过程






抑制大豆分子运动

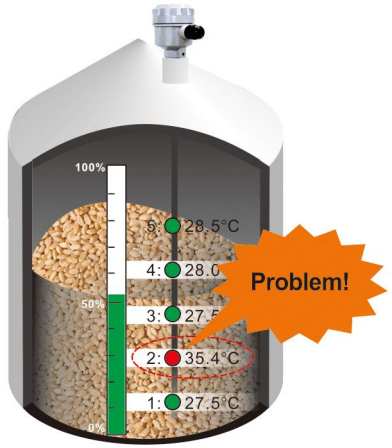
延缓其发酵过程

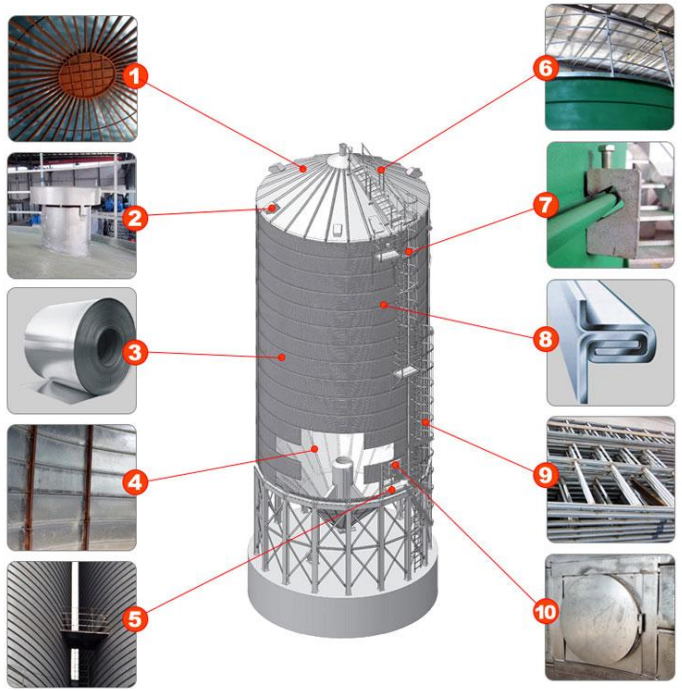
• 冷藏

这种技术对于大批量进口大豆是不现实的

• 常温下通风

排除大豆因呼吸和微生物作用散发出的热量，从而降低这些热量对大豆油脂和蛋白质的影响，延缓大豆自然发酵进程。



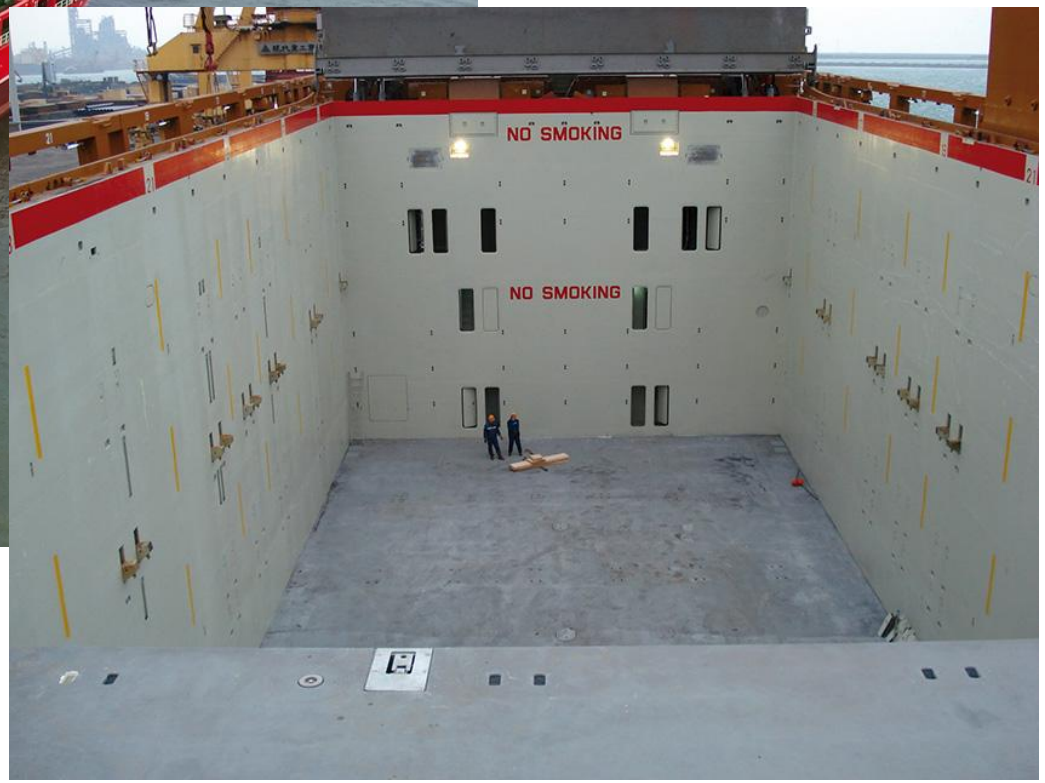


- 粮油加工厂通常采用具备通风措施的粮囤保存大豆。

- 老式杂货船

- 鹅颈头通风筒

- 蘑菇头通风筒



- 多用途船

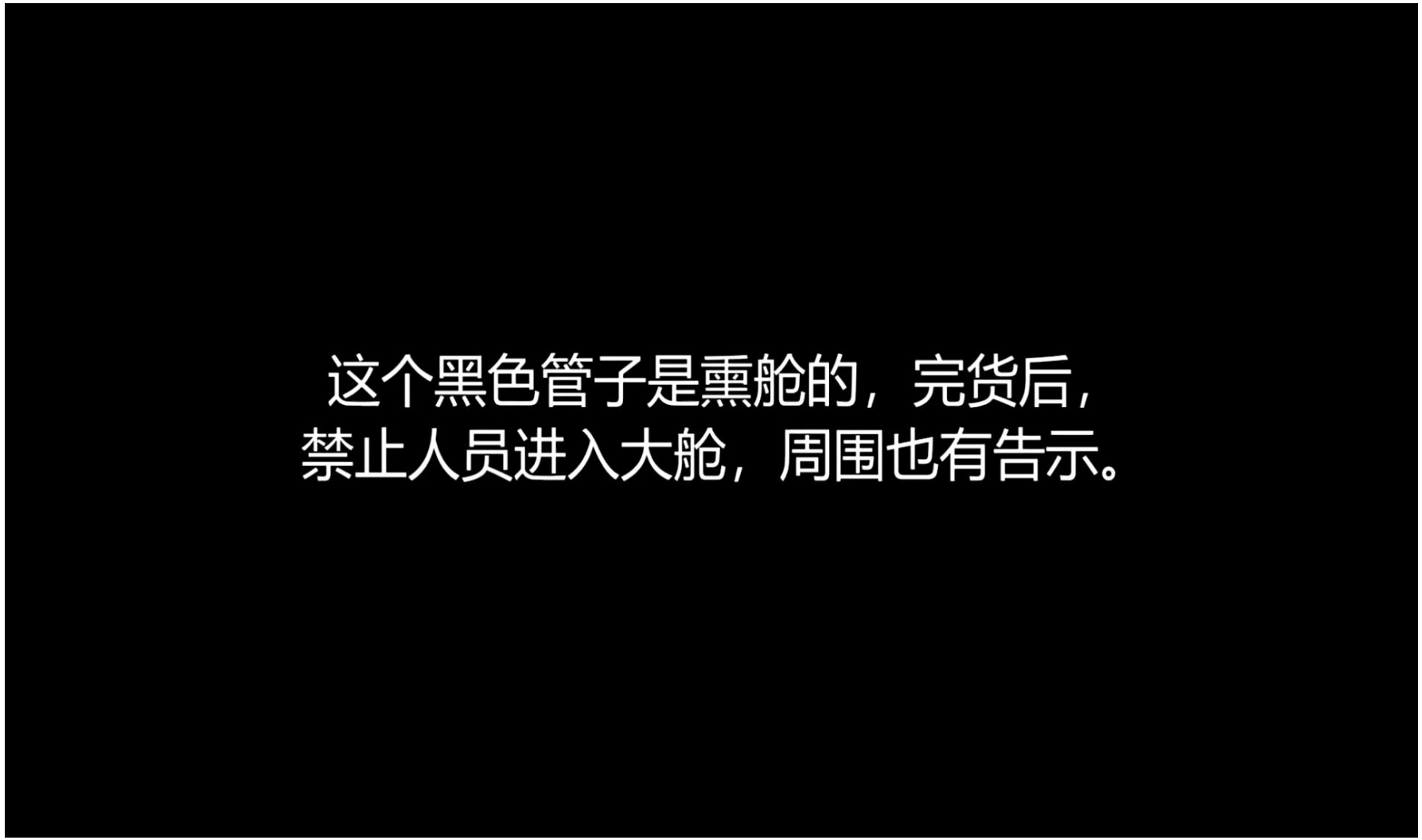
- 钢铁制品

- 谷物

- 矿石煤炭

- 通气孔

- 装货孔



- 美国熏蒸安排

- 轴流风机

- 波纹管

- 波纹管引向舱内

- 波纹管预留至货物与舱盖之间

- 人孔及电源

- 舱内管路俯视图

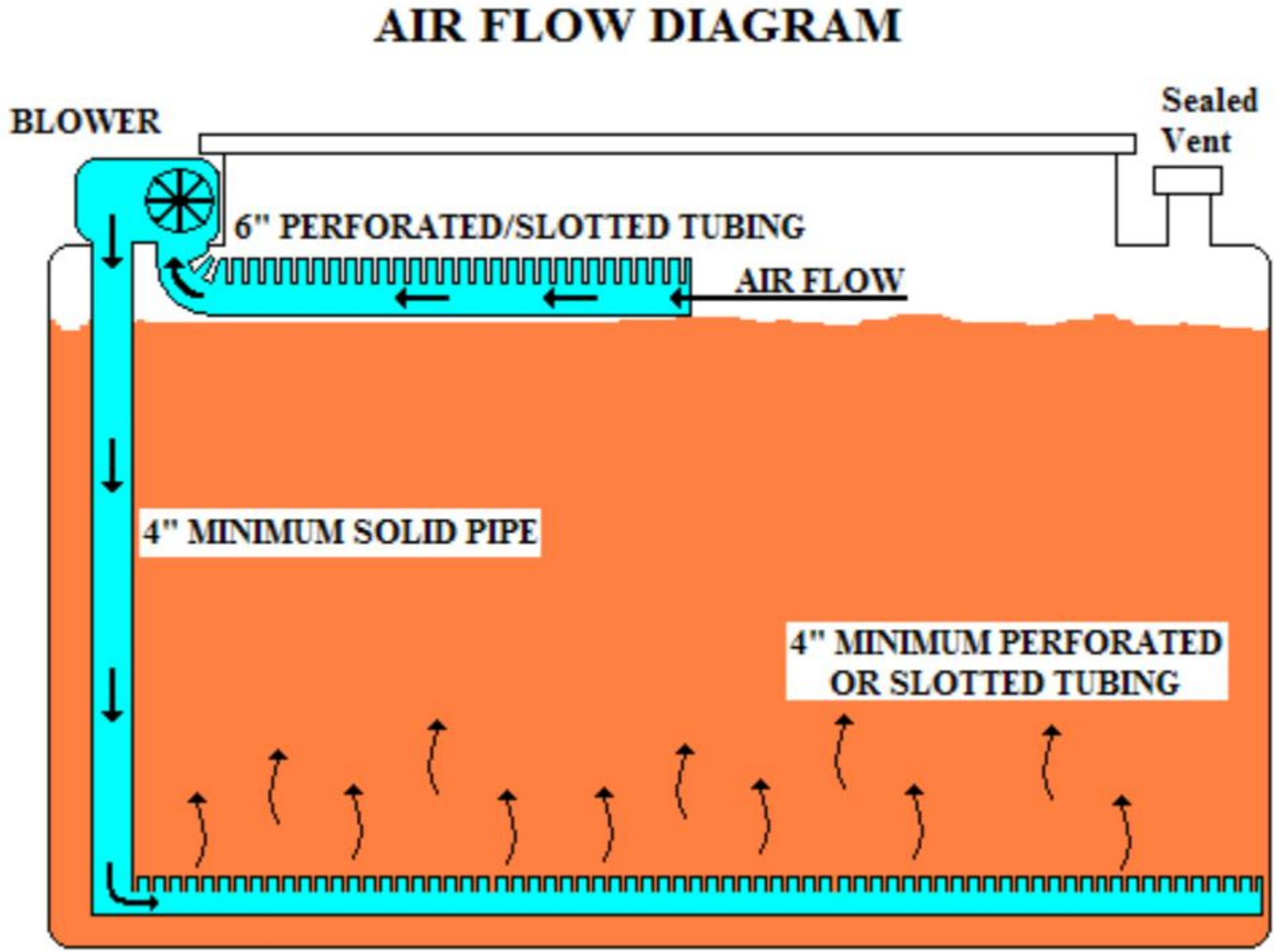


FIGURE 2.2 – AIR FLOW DIAGRAM

- 美国熏蒸计划

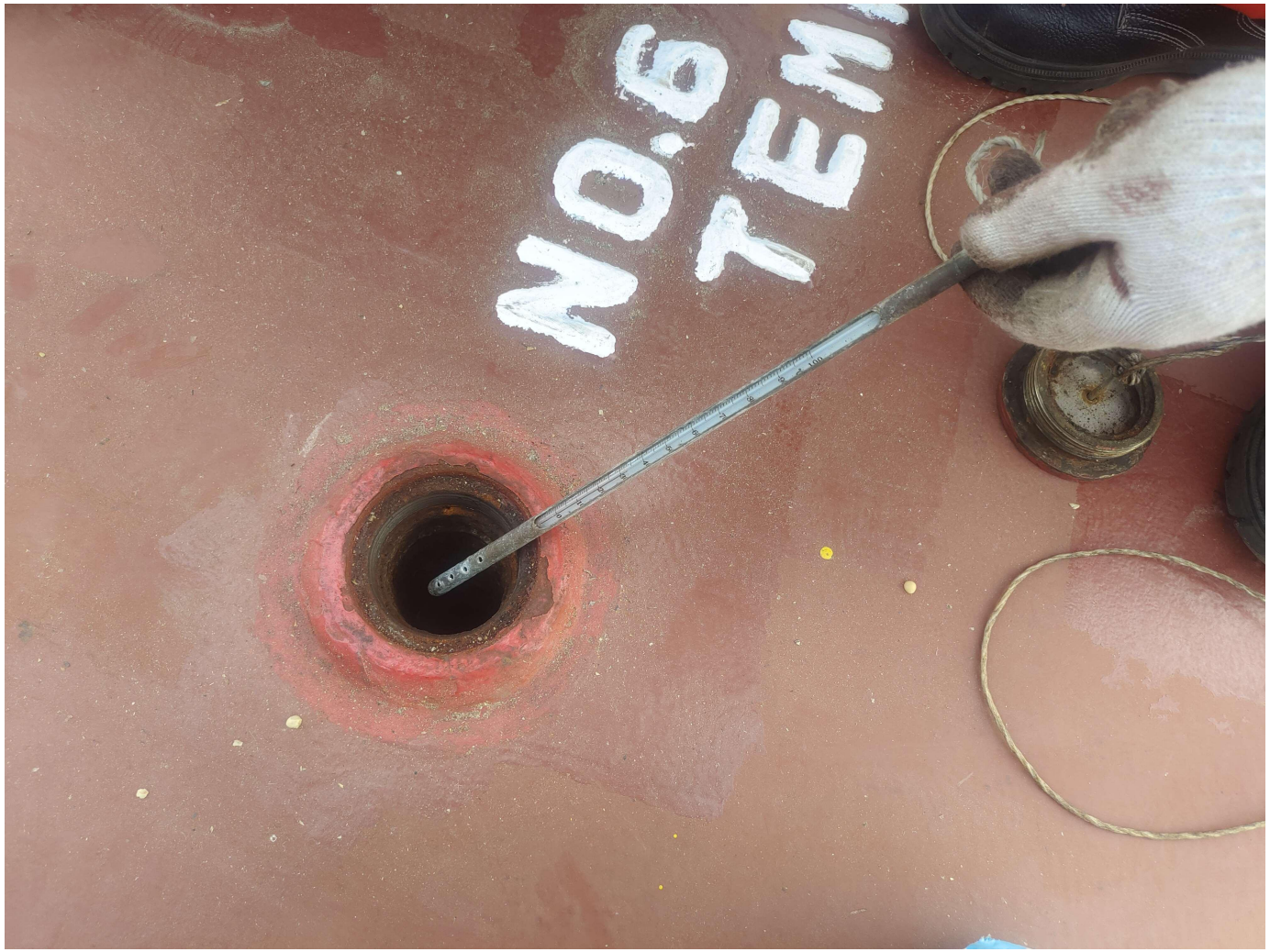
货舱通风的先决条件

- 舱内货物温度
- 舱内相对湿度

舱外明显低于舱内温度和相对湿度时，才能进行通风换气

否则，极有可能将海上潮湿高温空气引入舱内，导致大豆含水量增加，加速大豆热损进程。

- 货舱结构



- 货舱测温

- 货舱测温

- 在满载大豆的舱内，测温管内的温度并不是舱内大豆的实际温度。

测温管内的温度

- 是贴近隔舱壁的大豆温度
- 周边很小半径范围内的大豆温度
- 受到海水影响的隔舱壁的温度

“不可能通过测温管得到舱内货物的相对湿度”

- **Three-degree rule:** Ventilate a hygroscopic cargo if the temperature of the outside air is at least 3°C below that of the cargo temperature (taken at loading).

- 三度通风法则：如果货物的温度高于周边空气的温度至少三度，就可以采取通风的措施

大豆热损

原因分析

超标大豆

诱发或加速了热损进程

通风散热功能

散货船这种运输工具根本不具备通风散热功能

储存运输时间

大豆的自然成长发酵进程及微生物作用

那么，如何采取减损措施呢?

物流方式的改革和技术进步

首先，**缩短**大豆从脱离豆荚到油脂和豆粕生产过程的时间，这取决于物流方式的改革和技术进步。

大豆的国际市场价格升高

其次，所有的大豆交易合同都是按照FOSFA标准进行取样，大豆品质采用**MAPA（巴西标准）**。如果在贸易合同中能够约定，**取样按照我国行标进行，大豆品质采用中国国标**，混入舱内的超标大豆数量肯定会大大降低，发生大豆热损的可能性也会相应降低。

运输费用提高

最后，国际市场购买大豆的收货人或者是租船人，对于其使用的散货船的优势和劣势非常清楚，如果要解决大豆运输中的品质保护问题，很简单，就是在这些散货船上**安装像粮囤一样的测温和通风设备**，或**采用类似美国熏蒸计划**。

“散货船运输大豆就是一场游戏”

——游戏的成本应该由谁来承担，需审慎对待。