

Abstract

Major problems confronted by edible grade sesame oil producers in Sri Lanka today are finding out of right quality raw materials and maintaining of free fatty acid level of extracted oil within the stipulated level of SLSI. Therefore maintaining of acid value of sesame seeds and as well as maintaining of FFA level of sesame oil during extraction and during storage are very important aspects until fresh crop of next harvest is reaped.

Hence, in order to evaluate development of acids during storage, a series of experiments has been conducted for a period of 1 year using sesame seeds in five different forms; raw undecorticated, raw decorticated immediately before oil extraction, decorticated blanched, raw decorticated and undecorticated blanched.

Maintaining of FFA level below 3% during oil extraction and as well as during storage are also very important because enzymes in the oil, light in the vicinity, head space in the bottle and type of packing material are also responsible for further degradation of oil.

Enzymatic activities of oil during oil extraction by six successive compressions were monitored by using two types of seeds raw & blanched and oil obtained from each compression was analyzed for FFA. Oil extracted from blanched seeds was subjected to determination of influence of light and head space, by filling in fully, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ covered & fully exposed transparent bottles and filling of oil in amber color bottles in order to form large, medium & small head gap respectively.

Influence of packing material was also evaluated by filling of heat treated oil in amber color, green color, PVC, PET & clear glass bottles and increment of FFA was measured during 18 months of shelf life.

Development of acids in sesame seeds were analyzed monthly and results revealed that critical acid value of 6 was surpassed by each treatment, by 3, 11, 12, 3½ and 10 months with respect to the seeds in five different forms.

Studies on influence of light and head space in elevating of FFA after 18 months revealed that slight increment of FFA occurred in fully exposed bottles (2.9%) than in the fully covered bottles (2.6%) but head space didn't have any influence on FFA content. Increment and decrement of FFA occurred when raw and blanched seeds were compressed to get oil, from 1.8% to 5.5% and 2.8% to 1% respectively.

As far as packing materials of oil are concerned, increment of FFA in oil enclosed in the five types of bottles taken for the trial, namely amber color, clear glass, PVC, PET and green glass were 2.65%, 2.88%, 2.87%, 2.88% & 2.77% respectively after the 18th month. Hence, packing material does not influence in elevating FFA. Removal of seed coat of sesame seed is also a vital operation in reduction of acids in sesame seeds. Therefore, five prototype designs were tried out and the design rods with a cylinder perform satisfactorily with a 99% decortication.

Finally, excerpt of the study, is sesame seeds should be decorticated and blanched with super saturated steam for 5 minutes immediately before oil extraction or sesame seeds shall be prepared during harvesting season using decorticated or undecorticated seeds subjected for blanching process with the same heat treatment given above. Prepared seeds shall be dried and to be stored under normal environmental conditions (T 28 -32⁰C and RH 68 – 72%) for extraction of edible grade sesame oil during off season. Prepared seeds are to be subjected for 6 successive compressions through oil extractors. Extracted oil should be packed in glass or polymer containers and shall be kept under in house conditions.