營養標籤及營養聲稱
檢測方法技術指引

Method Guidance Notes on
Nutrition Labelling and Nutrition Claims

蛋白質
Protein

反式脂肪
Trans fat

碳水化合物
Carbohydrates

飽和脂肪
Saturated fat

鈉
Sodium

能量
Energy

總脂肪
Total fat

糖
Sugars

食物安全中心
Centre for Food Safety

營養標籤及營養聲稱檢測方法技術指引

食物環境衞生署
食物安全中心

引言

立法會已於二零零八年五月廿八日制定《2008年食物及藥物(成分組合及標籤)(修訂：關於營養標籤及營養聲稱的規定)規例》(下稱《修訂規例》)。《修訂規例》引進一套營養資料標籤制度(下稱"標籤制度")，涵蓋食物標籤上兩類主要營養資料，即營養標籤及與營養聲稱。爲協助業界適應《修訂規例》帶來的轉變，尤其是在營養素含量的準確性方面，食物環境衞生署的食物安全中心與業界及實驗室商討後擬備了這份方法指引。

免責聲明

2. 這份方法指引並不是相關法例的一部分，只供業界就標籤制度作參考之用，並應與相關法例(包括但不限於《修訂規例》)一併細閱。這份方法指引內的資料可能並非詳盡無遺或完備無缺。個別問題應按實際情況考慮。如有疑問，業界應徵詢獨立的法律意見。相關法例的最終解釋權屬於法庭。

背景

修訂法例的目的

3. 營養是人體生長、修補組織和維持健康不可或缺的元素。很多慢性退化疾病都與飲食失衡有關，例如冠心病、糖尿病和某些癌症。這些與營養息息相關的疾病，在世界各地(包括香港)都造成重大的公眾健康問題。

4. 食物標籤加上營養資料是一項重要的公共衞生工具以推廣均衡飲食。食物標籤是重要溝通渠道，讓消費者了解個別食品的具體資料。

5. 引進標籤制度的目的，是(i)幫助消費者作出有依據的食物選擇；(ii)鼓勵食品製造商提供符合營養準則的食品；以及(iii)規管有誤導或欺詐成分的標籤和聲稱。

定義

6. 在《修訂規例》中下列用詞的定義 –

- "可獲得的碳水化合物" (available carbohydrates)指總碳水化合物，但不包括膳食纖維。
- "膳食纖維" (dietary fibre)指藉著就認可及核准食物及農作物測定方法而獲國際認可的、名爲 AOAC INTERNATIONAL 的獨立組織所採用的任何正式方法而測定的任何纖維。
- "能量" (energy)就任何食物而言，指由該食物提供的、符合以下說明的能量 —
  (*a*) 以食物所含的可獲得的碳水化合物、蛋白質、總脂肪、乙醇及有機酸所提供的能量總數計算所得的；及
  (*b*) 按照食品法典委員會採用的《食典營養標籤準則》計算的。
- "營養素" (nutrient)指存在於食物中的、符合以下說明的任何物質 —
  (*a*) 屬以下其中一項類別或是以下其中一項類別的成分的 —
    (i) 蛋白質；
    (ii) 碳水化合物；
    (iii) 脂肪；
    (iv) 膳食纖維；
    (v) 維他命；
    (vi) 礦物質；及
  (*b*) 符合以下任何條件 —
    (i) 該物質提供能量；
    (ii) 該物質是身體生長、發育及維持身體正常功能所需的；
    (iii) 缺少該物質將導致出現生化或生理的特性變化。
- "糖" (sugars)指所有存在於食物中的單糖和雙糖。
- "反式脂肪酸" (trans fatty acids)指所有含最少一個非共軛反式雙鍵的不飽和脂肪酸的總和。
- "維他命 A" (vitamin A)指以食物所含的以下成分的總和計算所得的營養素 —
  (*a*) 視黃醇；及
  (*b*) 按視黃醇當量計算的 β-胡蘿蔔素(以 6 微克 β-胡蘿蔔素相等於 1 微克視黃醇當量計) 。

實驗室檢測

挑選分析實驗室

7. 我們建議製造商、進口商、銷售商和有關人士聘用檢測服務，以核實產品的營養標籤上的聲明。本港和海外均有不少實驗室分析食品，以供用於營養標籤。食物安全中心

建議業界挑選獲香港認可處轄下香港實驗室認可計劃認可爲符合ISO/IEC 17025各項標準的商營實驗室。香港認可處的認可實驗室目錄已臚列這些認可實驗室。食物安全中心並沒有規定業界只可選用香港實驗室認可計劃內的認可實驗室，但建議以這類實驗室作爲首選。此外，亦建議選用符合ISO/IEC 17025標準的認可海外實驗室。

8. 負責進行營養素分析的實驗室必須能夠證明具備以下條件：根據品質保證計劃運作，而有關計劃已詳細訂明各項程序，並保證所有樣本均會適當地記錄、貯存、抽取、分析和保管(如有需要)；保持所收集數據的完整性；分析員已接受適當的訓練；有關儀器經過校正；分析工作會以各種適當的認可方法並按照標準運作程序進行；以及核對所有數據，以確保數據準確無誤和結果合理。各種方法的標準運作程序應包括採用標準參考物質，摻標樣本或其他認可物質。

挑選分析方法

9. 爲執行有關規定，食物安全中心會採用 AOAC International (下稱 AOAC)正式方法最新版本中的適當方法。如沒有 AOAC 正式方法可供採用或這些方法並不適用，則會採用其他可靠而又適合的分析程序，例如聯合國糧食及農業組織《食品質量控制手冊》中的方法、ISO 方法、BS EN 方法或其他國家的標準方法。在測試膳食纖維方面，則只接受 AOAC 正式方法。

10. 如有適合的AOAC正式方法，食物安全中心會優先採用，因爲這些方法已在下列方面通過各種協同評估：

準確度：測試結果與接受參考值間的一致程度；
精密度：在規定條件下，獨立測試結果間的一致程度；
選擇度：有關方法在測定被分析物於混合物或樣本基質中，沒有被相似物質干擾的程度；
敏感度：在一個測量的系統上數據改變和對應被測量物的含量改變的商數；
線性：在特定濃度範圍內，有關分析方法於測量實驗室樣品中，提供有關儀器反應或結果與被分析物濃度相稱的結果的能力。

11. 由於現時AOAC正式方法並沒有涵蓋所有食物基質中的所有有關營養素，因此AOAC正式方法或需作出改動以符合標籤規定，這是公認的做法。經過適當的改動後，一些適用性似乎有局限的AOAC正式方法亦可用於其他食物基質。如已改動原有方法，應確立新方法的精密度和準確度。精密度通常可透過反覆分析得以證明，但準確度則必須有一種參考物質或一個標準物才能確定，而有關參考物質或標準物必須已就接受測量的被分析物制定了經核證濃度。歐盟標準物質局、歐盟參考物質及測量研究所、英國政府化學實驗室、美國標準技術研究院等提供的多種標準參考物質在基本成分和若干有機

營養素方面已獲核證，是部分食物的具代表性物質。

12. 我們建議，只有在沒有AOAC正式方法或其他國家標準方法／國際認可標準方法可供採用的情況下，業界才應採用其他方法。如制定及／或採用其他方法，應詳細記錄這些方法的分析程序和表現特點。

13. 有關測試個別營養素的細節方面，請參考在附件一的常見問題。

14. 食物安全中心爲本港地道特色食物進行各項化驗。市民及業界可透過營養資料查詢系統查閱有關資料。該系統是食物安全中心網頁內一個具有網上搜尋功能的資料庫(http://www.cfs.gov.hk/tc_chi/nutrient/indexc.shtml)。食物安全中心現時採用的分析方法載於附件二。食物安全中心並無規定其他實驗室必須使用這些方法。隨着分析方法不斷改善，採用的方法可能隨時改變。

食物環境衞生署
食物安全中心
二零零八年六月

附件一

常見問題

一般問題

1. 在本港出售的部分預先包裝食物已附有營養資料，業界可否直接採用這些資料？

由於部分國家對食品上標示的營養素可能有不同的定義，而銷售商和進口商應了解本港的營養標籤制度，故銷售商或進口商有責任確定由製造商提供有關食品中的營養素資料恰當和準確。

2. 我如何得知預先包裝食物內的營養素含量？政府會採用哪一種方法檢測營養素？

由實驗室檢測營養素是其中一種最直接的方法得知預先包裝食物內的營養素含量。坊間有不少商營檢測服務，分析預先包裝食物中的營養素。食物安全中心在決定選用哪一種方法時，會考慮檢測方法的最新發展。就現階段而言，食物安全中心將會採用AOAC正式方法檢測營養素。此外，亦可根據原材料的營養資料和烹煮方法計算出食物的營養資料(間接營養素分析)。不過，業界須確保有關營養資料正確無誤。有關間接營養素分析的資料，可參閱《營養標籤及營養聲稱技術指引》。

3. 我可否採用AOAC正式方法以外的其他方法檢測營養素含量？

所有AOAC正式方法均列明適用的食物基質。不同AOAC正式方法都可用來檢測同一種營養素，但適用於不同的基質。因此，選擇適合的方法對取得正確結果至爲重要。至於沒有適合的AOAC正式方法作檢測的食物基質，則可採用其他或經修訂的方法。在測試膳食纖維方面，則只接受AOAC 正式方法。

4. 食物中的營養素檢測限有什麼要求？

在檢測食物樣本中的營養素時，應採用以現有最先進的技術可合理達到的較低檢測限。對於《營養標籤及營養聲稱技術指引》中附有"0"的定義的每一種營養素，商營實驗室提供的檢測限應低於"0"的相應定義。可是，當檢測食物樣本中的飽和脂肪及反式脂肪以便作出"不含飽和脂肪"的聲稱時，因爲每100克食物不能含高於0.1克飽和脂肪與反式脂肪的總量，檢測限應爲每100克食物不高於0.05克飽和脂肪或反式脂肪。

5. 規管容忍限是否已包括檢測方法的不確定度？

在制定規管容忍限時，我們並沒有考慮檢測方法的不確定度。業界須另行處理有關測量精確度的問題。

能量

6. 我如何測量食物樣本中的能量含量？

計算能量的方法是把食物中可獲得的碳水化合物、蛋白質、總脂肪、乙醇及有機酸的含量分別乘以相關的換算系數，然後全部相加。計算程式如下：

每100克食物中所含的[可獲得的碳水化合物(克) x 4 +蛋白質(克) x 4 +總脂肪(克) x 9 + 乙醇(酒精) (克) x 7 + 有機酸(克) x 3]= 每100克食物所含的能量(千卡)

7. 我何時需要在計算能量時包括乙醇(酒精)？

計算能量時一般應包括來自乙醇的能量。但不是所有食物都含有乙醇。當乙醇是主要的能量來源時，就必須測定其含量，並在計算能量時包括在內，尤其是酒精類飲料、含酒精的甜點和甜品。氣相色譜法是準確有效測量乙醇的常用方法。

8. 我可否採用滴定法測定“有機酸”含量？

對於“有機酸”一詞，食品法典委員會的指引從沒有給予定義。不同種類的食物含有不同的有機酸。在“奶類”、“肉類”和“蔬果”三類食物中，最主要的有機酸分別是檸檬酸、乳酸、以及蘋果酸和檸檬酸。不過，部分預先包裝食物含大量有機酸，例如水果、水果製品(包括果汁)、某些蔬菜(尤其是使用了乙酸的醃菜)和其他製品(包括醋、沙律醬、汽水和乳酪)。業界宜採用液相色譜法或與AOAC正式方法986.13相近的方法測定各種有機酸的含量。

9. 有些國家就個別糖醇制定特定的能量換算系數，我可否採用這些系數來計算能量含量？

食品法典委員會的《關於營養標識的法典準則》(CAC/GL 2-1985) 和中國內地的營養標籤規定均沒有就各種糖醇訂下特定的能量含量。如果我們採用減法計算可獲得的碳水化合物含量，預先包裝食物中的糖醇含量會包括在內(參閱第19題)，因此碳水化合物的能量換算系數亦適用於糖醇。

10. 不同的水分和灰分測定法會採用不同溫度，前者的幅度是100℃至110℃，而後者則爲 500℃至600℃。究竟水分和灰分測定法所採用的溫度應爲多少？

雖然各國標準方法或各種國際標準方法採用不同的溫度檢測水分和灰分含量，但以105℃和550℃爲最常採用的溫度，因此建議分別以105℃和550℃來進行水分和灰分分析。

蛋白質

11. 我可否透過檢測克氏氮含量來檢測蛋白質？

蛋白質含量可根據食物樣本中的氮含量來測定，而氮含量則可透過克氏定氮法或燃燒定氮法來測定。食物安全中心曾比較兩種定氮法，發現兩者所得結果相若。除非食品法典委員會爲某食物制定的標準或分析方法另有不同的換算系數，否則應把氮含量乘以6.25計算蛋白質含量。至於特定的新鮮食物，氮含量換算系數則由6.38(乳清粉或乳清)至5.70(珍珠粟或大豆)不等。

由於蛋白質是由多條以肽鍵連接的氨基酸鏈組成，可把蛋白質水解爲氨基酸並測量其含量，從氨基酸的總和可得到食物中的蛋白質含量。這種檢測方法的好處是無須應用換算系數，但費用卻高昂得多。

脂肪

12. 我可否把透過換算個別脂肪酸得出的個別甘油三酸酯的總和作爲脂肪總量？

脂肪總量一般指甘油三酸酯，磷酯，蠟酯，固醇和小量非脂肪物質的總和。各種非甘油三酸酯的成分在新陳代謝過程中可能發揮重要的作用，因此，當局會接受各種以重量法來測定脂肪總量的AOAC方法。

13. 飽和脂肪是什麼？

飽和脂肪指不包含雙鍵的脂肪酸總量，通常爲13種飽和脂肪酸的總和。該13種飽和脂肪包括$C_{4:0}$，$C_{6:0}$，$C_{8:0}$，$C_{10:0}$，$C_{12:0}$，$C_{14:0}$，$C_{15:0}$，$C_{16:0}$，$C_{17:0}$，$C_{18:0}$，$C_{20:0}$，$C_{22:0}$和$C_{24:0}$。

14. 反式脂肪是什麼？

反式脂肪指所有含最少一個非共軛反式雙鍵的不飽和脂肪酸的總和。更具體地說，它指在碳鏈上含有非共軛反式雙鍵的單元和多元不飽和脂肪酸的所有幾何異構體，而兩個非共軛反式雙鍵之間會由至少一個亞甲基隔開。反式脂肪通常爲 $C_{14:1T}$(9-反式)，$C_{16:1T}$(9-

反式)，$C_{18:1T}$(總)，$C_{18:2TT}$(9,12-反式)，$C_{18:2T}$(9-順式，12-反式)，$C_{18:2T}$(9-反式，12-順式)，$C_{20:1T}$(11-反式)及 $C_{22:1T}$(13-反式)的總和。

膳食纖維

15. 由於“膳食纖維”的檢測結果與檢測方法有關，更改膳食纖維的定義會大大影響標籤和聲稱事宜。業界應採用哪些AOAC正式方法來測定膳食纖維含量？

根據修訂規例，必須以AOAC正式方法測試食物中的膳食纖維。一般而言，食物安全中心會採用AOAC正式方法985.29及／或2001.03來測量預先包裝食物中的膳食纖維含量。如有需要，食物安全中心會要求製造商、進口商或銷售商提供他們所採用的方法，以作進一步跟進。

16. 我可否採用Englyst方法測定預先包裝食物中的膳食纖維含量？

Englyst方法較複雜，在國際間並非廣爲使用，故不太適合用於日常分析。此外，Englyst方法所得的數值一般較AOAC正式方法985.29或2001.03爲低。因此，當局只接受AOAC正式方法。一般而言，食物安全中心會採用AOAC正式方法985.29及／或2001.03來測量預先包裝食物中的膳食纖維含量。如結果與所標示的含量不符，食物安全中心會要求製造商、進口商或銷售商提供他們所採用的方法，以作進一步跟進。

17. 我可否採用AOAC正式方法2001.03來檢測膳食纖維含量？AOAC正式方法985.29與2001.03有何區別？

AOAC正式方法985.29或991.43可測定膳食纖維總量，即食物中不可溶性和可溶性膳食纖維的總和。AOAC正式方法985.29中的膳食纖維總含量，指不可溶性和可溶性膳食纖維的總和。不過，AOAC正式方法2001.03則測定食物中的不可溶性膳食纖維，高分子量可溶性膳食纖維和低分子量抗性麥芽糊精，並把膳食纖維總量界定爲不可溶性膳食纖維、高分子量可溶性膳食纖維和低分子量抗性麥芽糊精的總和。因此，AOAC正式方法985.29和2001.03所得的膳食纖維總量結果或會不同，而有關差異視乎食物樣本是否含有可引致陽性檢測結果的抗性麥芽糊精或其他碳水化合物聚合物。

18. 如預先包裝食品含有功能性纖維，AOAC正式方法985.29會否低估膳食纖維含量？

在許多國家中，預先包裝食物中的人造合成寡糖或經提取的天然寡糖和合成抗性澱粉，如具有對人體有益的生理效用，則屬於纖維。AOAC正式方法985.29是不適合用來測試這些纖維。這些碳水化合物聚合物所造成的膳食纖維，必須採用AOAC正式方法997.08、2001.03和2000.11等特定的檢測方法來檢測。簡言之，當局採納下列檢測方法檢測功能

纖維 -

功能纖維	商品名稱	檢測方法
β-聚葡萄糖	Imprime PGG®	AOAC 995.16
寡果糖	Raftilose®, OliggoFiberTM	AOAC 997.08或999.03
菊苣寡糖	Neosugar, Actilght®	AOAC 997.08或999.03
聚葡萄糖	Litesse®	AOAC 2000.11
低聚半乳糖	Yacult, Borculo Whey Products	AOAC 2001.02
抗性麥芽糊精	Fibersol-2	AOAC 2001.03
抗性澱粉	C*Actistar	AOAC 2002.02

碳水化合物(包括糖)

19. 我爲什麼要檢測食物樣本中的水分和灰分含量？

多年以來，食物中可獲得的碳水化合物含量一直採用減法計算出來，而不是透過直接分析。根據這種方法，食物中有關成分(蛋白質、脂肪、水分、酒精、灰分和膳食纖維)會逐一測定，然後全部相加，再以食物的總重量減去相加總和，最終所得數值就是以減法得出的可獲得的碳水化合物。有關計算公式如下：

100 – (100克食物中的[蛋白質 + 脂肪 + 水分 + 灰分 + 酒精(乙醇) + 膳食纖維]重量克數)

20. 總碳水化合物與可獲得的碳水化合物有何區別？

總碳水化合物指可獲得的碳水化合物和膳食纖維的總和。

21. 含有不能消化物質的部分預先包裝食物(例如香口膠)可否採用減法計算出碳水化合物含量？

如知道預先包裝食物中不能消化物質的含量，仍可應用減法計算出可獲得的碳水化合物，只要加入不能消化物質這個系數即可。此外，亦可把澱粉、可獲得的糖總量、可獲得的寡糖、可獲得的糖原和可獲得的麥芽糊精(如取得前述三項成分的含量或食物中添加了前述三項成分的話)的含量全部相加，計算出可獲得的碳水化合物含量。

22. 糖醇是否屬於碳水化合物？

糖醇(又稱爲多元醇)是一種氫化形態的碳水化合物，其羰基(醛或酮)已還原爲一級或二級羥基。一般而言，糖醇屬於碳水化合物成分。

23. 糖的檢測應包括多少種單糖和雙糖？

根據國際趨勢，果糖、半乳糖、葡萄糖、乳糖、麥芽糖和蔗糖都是常見檢測項目。

24. 在糖的檢測方面，我可否檢測還原糖而不檢測單糖和雙糖？

糖是指所有存在於食物中的單糖和雙糖。如食物樣本只含有一種還原糖，還原糖檢測結果會與採用高效液相色譜法所得的分析結果相若。但如樣本含有多於一種糖，還原糖檢測結果便不能真實反映樣本中規例所指定的糖的含量。

維他命及礦物質

25. α-胡蘿蔔素是否屬於維他命A？

具有維他命原A活性的類胡蘿蔔素包括α-胡蘿蔔素、β-胡蘿蔔素、γ-胡蘿蔔素和β-隱黃素。根據食品法典委員會，換算系數應爲6微克β-胡蘿蔔素相等於1微克視黃醇當量，而規例也指定在換算維他命A時，β-胡蘿蔔素是唯一採用於這換算系數的類胡蘿蔔素。BS EN 12823:2000 Part 1及Part 2分別適合用來測量食物中的視黃醇及β-胡蘿蔔素。

26. 食物中有多少種維他命D？

食物中通常有兩種維他命D，分別是膽鈣化醇(D_3)和麥角鈣化醇(D_2)。維他命D_3較廣泛存在於不同的食物，例如魚油、多種含脂肪的魚組織、蛋類、牛油和忌廉乳酪等，而維他命D_2則天然存在於魚油和菇類中，但含量不高。部分肉類的25-羥膽鈣化醇含量可引致維他命D活性，業界需考慮把它計算在內。BS EN 12821:2000可用來測量食物中的維他命D。

27. β-生育酚是否等同維他命E？

在化學結構上屬於生育酚和三烯生育酚的八種物質天然具有維他命E活性。與α-生育酚這種基本結構比較，每一種不同的維他命具有不同的維他命活性。因此，會以能夠把各種不同的維他命分離並逐一測量的分析方法較佳。BS EN 12822:2000適宜用來測量食物

中的生育酚。根據聯合國糧食及農業組織，包含各種天然維他命E的混合膳食中的α-生育酚當量可估計爲以毫克計算的α-生育酚、0.5β-生育酚、0.1γ-生育酚、0.01δ-生育酚和0.3α-三烯生育酚的總和。

28. 異抗壞血酸可否當作維他命C計算？

現時有兩種物質具有維他命C活性，分別是L-抗壞血酸及其首個氧化產物L-脫氫抗壞血酸。至於D-異構體(即異抗壞血酸)，則不具有活性，可用作抗氧化食物添加劑。因此，維他命C指以毫克計算的L-抗壞血酸和L-脫氫抗壞血酸的總和。

29. 煙酸是否等同煙酰胺？

“煙酸”(維他命 B_3)是煙鹼酸、煙酰胺和各種含有煙酰胺的生物活性的衍生物的通稱。

30. 食物中的葉酸含量可否以膳食葉酸當量來表示？

由於人工合成葉酸的人體吸收利用率是85%，而天然存在葉酸的人體吸收利用率則只有大約50%，故前者的人體吸收利用率較高，爲後者的85/50(即1.7倍)。因此，在計算包含天然存在葉酸和人工合成葉酸的混合膳食中的葉酸當量時，可估計爲以微克計算的天然存在葉酸和1.7人工合成葉酸的總和，並以“微克膳食葉酸當量”來表示。

31. 我可否不採用AOAC正式方法985.35，而使用其他AOAC正式方法來測定食物中的鈣含量和鈉含量？

在鈣分析方面，業界人士都知道，如沒有在樣本和標準中使用鑭，就會出現陰離子化學干擾，例如磷酸鹽、硫酸鹽和鋁的干擾。因此，其他採用鑭以減少陰離子化學干擾的方法都適宜用作分析。

至於以火焰原子吸收光譜法或電感耦合等離子體原子發射光譜法進行的鈉分析，鈉可能未完全離子化的影響而減低其發出的光度。樣本中含有其他鹼鹽可減低離子化作用，從而影響分析結果。如鈉與鉀的比例低於10，鈉的離子化抑制作用會較小。在樣本溶液和標準溶液中加入大量銫，可使由食物中其他鹼鹽引致的影響穩定下來。因此，其他採用銫以減低離子化抑制作用的方法都適宜用來作鈉分析。此外，又應分析空白試劑，以修正緩衝液中的鈉雜質。

附件二

食物安全中心**現時用來測量各種本港地道食品中的營養素含量的檢測方法一覽表**

營養素	參考方法	技巧
脂肪總量	AOAC 922.06	經過加酸水解後再提取。
氮總量	AOAC 928.08 或 AOAC 992.15	透過克氏定氮法或燃燒定氮法檢測氮含量。
水分	ISO 1442:1997	水分在105℃的環境下烘乾後，再以重量法測定。
灰分總量	ISO 936:1998	灰分在550℃的環境下烘乾、碳化和焚燒後，再以重量法測定。
飽和脂肪酸和反式脂肪酸	AOAC 996.06	使用100米 x 0.25毫米 x 0.2微米的SP2560柱進行毛細管氣相色譜法。
鈉	AOAC 969.23 或 AOAC 985.35	經過酸消解後再採用電感耦合等離子體原子發射光譜法。
鈣	AOAC 969.23 或 AOAC 985.35	經過酸消解後再採用電感耦合等離子體原子發射光譜法。
膽固醇	AOAC 994.10	直接皂化和毛細管氣相色譜法。
膳食纖維	AOAC 985.29	蛋白質和碳水化合物經過脫脂和酶水解後，再以重量法測定。
糖(所有單糖和雙糖)	AOAC 980.13 (經改良的高效液相色譜柱和高效液相色譜流動相)	採用水溶液提取後再進行高效液相色譜法 – 折射指數檢測。

註：

有關以上引述的所有AOAC正式方法，請參考AOAC Official Method, 18th Edition, Current Through Revision 2, 2007 AOAC INTERNATIONAL。

食物安全中心並無規定其他實驗室必須使用上述檢測方法。

Method Guidance Notes on

Nutrition Labelling and Nutrition Claims

Centre for Food Safety

Food and Environmental Hygiene Department

INTRODUCTION

The Food and Drugs (Composition and Labelling) (Amendment: Requirements for Nutrition Labelling and Nutrition Claim) Regulation 2008 (the "Amendment Regulation") was enacted by the Legislative Council on 28 May 2008. The Amendment Regulation introduces the Nutrition Labelling Scheme ("the Scheme") which covers two main types of nutrition information on food labels, namely nutrition labelling and nutrition claims. In order to assist the trade to adapt to the changes brought about by the Amendment Regulation, in particular on the accuracy of nutrient amounts, Centre for Food Safety ("CFS") of the Food and Environmental Hygiene Department has prepared the Method Guidance Notes in consultation with the trade and laboratory service providers.

DISCLAIMER

2. The Method Guidance Notes are not part of the legislation and are intended for use only as a general reference of the Scheme. It should be read in conjunction with the legislation including but not limited to the Amendment Regulation. Information contained in the Method Guidance Notes may not be exhaustive or complete. Specific issues should be considered on a case by case basis and independent legal advice should be sought in case of doubt. The ultimate authority for interpretation of the legislation rests with the Courts.

BACKGROUND

Objective of Legislative Amendment

3. Nutrition is essential for growth, tissue repair and maintenance of good health. On the other hand, many chronic degenerative diseases such as coronary heart disease, diabetes and certain types of cancer are related to an imbalanced diet. These nutrition-related diseases are important public health problems in many parts of the world including Hong Kong.

4. Providing nutrition information on food labels is an important public health tool to promote a balanced diet as food label is an important communication channel whereby consumers can obtain specific information on individual food products.

5. The introduction of the Scheme aims to (i) assist consumers in making informed food choices; (ii) encourage food manufacturers to apply sound nutrition principles in the formulation of foods; and (iii) regulate misleading or deceptive labels and claims.

DEFINITIONS

6. Selected terms are defined in the Amendment Regulation –

- "Available carbohydrates" (可獲得的碳水化合物) means total carbohydrates excluding dietary fibre.
- "Dietary fibre" (膳食纖維) means any fibre analyzed by means of any official methods adopted by the independent organization internationally recognized as regards validating and approving analytical methods for foods and agriculture known as AOAC INTERNATIONAL.
- "Energy" (能量), in relation to any food, means the energy provided by the food which is –
  - (*a*) calculated as the total amount of energy contributed by available carbohydrates, protein, total fat, ethanol and organic acids contained in the food; and
  - (*b*) calculated according to the Guidelines on Nutrition Labelling adopted by the Codex Alimentarius Commission.
- "Nutrient" (營養素) means any substance present in food which –
  - (*a*) belongs to, or is a component of, one of the following categories –
    - (i) protein;
    - (ii) carbohydrates;
    - (iii) fat;
    - (iv) dietary fibre;
    - (v) vitamins;
    - (vi) minerals; and
  - (*b*) satisfies any of the following conditions –
    - (i) the substance provides energy;
    - (ii) the substance is needed for growth, development and normal functions of the body;
    - (iii) a deficit of the substance will cause characteristic bio-chemical or physiological changes to occur.
- "Sugars" (糖) means all mono-saccharides and di-saccharides present in food.
- "Trans fatty acids" (反式脂肪酸) means the sum of all unsaturated fatty acids which contains at least one nonconjugated and trans double bond.

- "Vitamin A" (維他命 A) means a nutrient calculated as the sum of the following components contained in the food –
  (*a*) retinol; and
  (*b*) beta-carotene calculated in terms of Retinol Equivalent (with 6 µg of beta-carotene as being equivalent to 1 µg of Retinol Equivalent)".

LABORATORY TESTING

Selecting an Analytical Laboratory

7. Manufacturers, importers, vendors, or any relevant parties, are recommended to engage laboratory testing to verify their own nutrition label declarations. There are many laboratories in Hong Kong and overseas that analyze food products for nutrition labelling purpose. CFS recommends the selection of commercial laboratories that are accredited to ISO/IEC 17025 standard under the Hong Kong Laboratory Accreditation Scheme ("HOKLAS") by the Hong Kong Accreditation Service ("HKAS"). These accredited laboratories could be found in the Directory of Accredited Laboratories of HKAS. CFS does not impose the use of only HOKLAS accredited laboratories but recommends them as a first choice. ISO/IEC 17025 accredited laboratories from other countries are also recommended.

8. Laboratories performing nutrient analyses should be able to demonstrate that they operate under a documented quality assurance programme that provides assurance that samples are adequately logged, stored, sampled, analyzed, and archived (if needed); that the integrity of the data collected is maintained; that analysts are appropriately trained; that equipment is calibrated; that analyses are conducted by appropriately validated methods and according to standard operating procedures; and that data are checked for errors and for reasonableness of results. Standard operating procedures for each method should include the use of standard reference materials, spiked samples, or other validation materials.

Selecting the Analytical Methodology

9. For enforcement purposes, CFS uses appropriate methods as given in the most recent edition of Official Methods of Analysis of AOAC International, or if no AOAC official method is available or appropriate, by other reliable and appropriate analytical procedures such as those methods stated in the Manuals of Food Quality Control of Food and Agriculture Organization of United Nation ("FAO"), ISO methods, BS EN methods, or other national standard methods. For the testing of dietary fibre, however, only AOAC official methods are acceptable.

10. Whenever possible, CFS uses AOAC Official Methods because such methods have undergone collaborative evaluations with respect to the following:

Accuracy: the closeness of agreement between a test result or measurement result and a reference value;

Precision: the closeness of agreement between independent test/measurement results obtained under stipulated conditions;

Selectivity: the extent to which a method can determine particular analyte(s) in a mixture(s) or matrice(s) without interferences from other components of similar behaviour;

Sensitivity: quotient of the change in the indication of a measuring system and the corresponding change in the value of the quantity being measured;

Linearity: the ability of a method of analysis, within a certain range, to provide an instrumental response or results proportional to the quantity of analyte to be determined in the laboratory sample.

11. It is well recognized that modifications of AOAC Official Methods may be needed to comply with labelling requirements because Official Methods are not currently available for all nutrients of interest in all food matrices. With appropriate modifications, some AOAC official methods that appear to be of limited applicability can be modified for use in other food matrices. When original methods are modified, the precision and accuracy of the new applications should be established. While precision can usually be demonstrated with replicate assays, determination of accuracy requires a material or a standard with a certified concentration of the analyte being measured. A number of standard reference materials available from the European Union's Community Bureau of Reference, European Union's Institute of Reference Materials and Measurements, United Kingdom's Laboratory of Government Chemist, United States of America's National Institute of Standard and Technology, etc. are certified for elemental composition and some organic nutrients and are representative of some foods.

12. Alternative methodology is recommended only in the absence of AOAC Official Methods or national/internationally recognized standard methods. If alternative methods are developed and/or used, they should be accompanied by documentation that describe in detail the analytical procedures and performance characteristics of the methods.

13. Details on the testing of individual nutrient are provided in the section on Frequently Asked Questions at Annex I.

14. CFS is conducting laboratory tests of local indigenous mixed foods, with information available for public access through the Nutrient Information Inquiry System, an on-line searchable nutrient database on the CFS web site [http://www.cfs.gov.hk/english/nutrient/index.shtml]. Methods of analysis currently used by the CFS are set out in Annex II for reference. The CFS does not require other laboratories to use these methods. As improvements in methodology become available, there may be changes to the adoption of these methods any time.

Centre for Food Safety
Food and Environmental Hygiene Department
June 2008

Annex I

Frequently Asked Questions

General

1. Some prepackaged foods sold in Hong Kong already come with nutrition information. Can the nutrition information be used directly?

Since other countries may have different definitions for the nutrients labelled in the food product and the vendor and importer should have the knowledge of the nutrition labelling system in Hong Kong, it is the vendor's or importer's responsibility to confirm the relevancy and accuracy of the information obtained from the manufacturers regarding the nutrients present in the food product.

2. How can I know the content of the nutrients in a prepackaged food? Which method will the Government adopt for testing the nutrients?

Testing the nutrients by a laboratory is one of the most straightforward ways to know the content of the nutrients in a prepackaged food. Testing services are commercially available for analyzing the nutrients in prepackaged foods. CFS will consider the latest development of the testing methods when deciding the methods to use. At the moment, AOAC Official Methods will be adopted by CFS for testing nutrient content. Nutrition information may also be calculated based on the nutrition information of the raw materials and their cooking method (i.e. indirect nutrient analysis). However, the trade needs to ensure that the nutrition information is correct. More information on indirect nutrient analysis is provided in the "Technical Guidance Notes on Nutrition Labelling and Nutrition Claims".

3. Can I use methods other than AOAC official methods to test the nutrient content?

Every AOAC official method specifies the applicable food matrices. A number of AOAC official methods are found to be acceptable to test the same nutrient, but in different matrices. Hence, the selection of an appropriate method is crucial to obtain the correct result. For those food matrices that suitable AOAC official method cannot be found, alternative or modified method can be employed. For the testing of dietary fibre, however, only AOAC official methods are acceptable.

4. What are the detection limits for the nutrients in foods?

A reasonably practicable low detection limit by the best available technology should be adopted for detecting nutrients in a food sample. For each nutrient with definition of "0" provided in the "Technical Guidance Notes on Nutrition Labelling and Nutrition Claims", the detection limit provided by the

commercial testing laboratory should be lower than the corresponding definition of “0”. However, for testing saturated fat and trans fat of a food sample with the claim of “Free of saturated fat”, the detection limits for saturated and trans fat should not be higher than 0.05 g per 100 g, as the relevant standard is that the food can contain not more than 0.1g of saturated fat and trans fat combined .

5. Do the tolerance limits cover the measurement uncertainty of test methods?

The measurement uncertainty of test methods was not taken into consideration when tolerance limits were set. The measurement uncertainty has to be dealt with separately.

Energy

6. How can I measure the energy content of a food sample?

Energy is obtained by the summation of the energy contributed by available carbohydrates, protein, total fat, ethanol, and organic acids, multiplied by corresponding conversion factors. It is calculated by the following formula:

(weight in grams [4 x available carbohydrates + 4 x protein + 9 x total fat + 7 x ethanol(alcohol) + 3 x organic acids] kcal in 100 g of food)

7. When do I need to include ethanol (alcohol) in the energy calculation?

Energy calculation includes energy contribution from ethanol. However, not all food contains ethanol. When ethanol is a significant energy contributor, its level must be determined and included in energy calculation, especially for alcoholic beverages, confectionery and desserts containing alcohol. Measurement of ethanol by gas chromatographic method is a common, valid and precise approach.

8. Can I determine the “organic acids” content by titration?

For “organic acids”, the Codex's guidelines have not provided a definition. Different types of food would contain different organic acids. For “milk”, “meat”, “vegetable and fruit”, the predominant organic acid(s) are citric acid, lactic acid, and malic acid and citric acid respectively. However, some prepackaged foods would have significant amount of organic acids, such as fruits, fruit products (including juices), a few vegetables (particularly those preserved in acetic acid), and other manufactured products (including vinegar, salad dressings, soft drinks and yoghurt). Liquid chromatographic method similar to AOAC official method 986.13 for determining the content of different organic acids is preferred.

9. Some countries have provided specific energy conversion factor for individual sugar alcohols. Can I use these factors to calculate the energy content?

According to Codex's "Guidelines on Nutrition Labelling, CAC/GL 2-1985 (Rev. 1 – 1993, Amend. 2 - 2003)" and the nutrition labelling requirements proposed by Mainland China, no specific energy contributors are assigned for sugar alcohols. Since the content of sugar alcohols in a prepackaged food would be included in the available carbohydrates content if it is calculated by the difference (refer to question 19), the energy conversion factor for carbohydrates would also be applied to sugar alcohols.

10. What is the temperature for the determination of moisture and ash since different methods use different temperature and it varies from 100˚C to 110˚C and 500˚C to 600˚C respectively?

Though different national or international standard methods use different temperature to test for moisture and ash content, 105˚C and 550˚C are the most commonly used temperature for the determination of moisture and ash respectively. Therefore, it is advised that 105˚C and 550˚C be used for the analysis of moisture and ash respectively.

Protein

11. Can I test for protein by testing the Kjeldahl nitrogen content?

The protein content can be determined based on the nitrogen content in the food sample while the nitrogen content can be determined by Kjeldahl method or combustion method. CFS has compared the two methods and found that they give comparable results. Unless a different nitrogen conversion factor is given in a Codex standard or in the Codex method of analysis for that food, the nitrogen content is multiplied by a factor of 6.25 to arrive at protein content. For selected raw foods, the nitrogen conversion factor could vary from 6.38 (whey powders or milk) to 5.70 (pearl millet grain or soybean).

Because proteins are made of chains of amino acids joined by peptide bonds, they can be hydrolysed to their component amino acids, which can then be measured. The sum of the amino acids then represents the protein of the food. This method has an advantage of removing the use of nitrogen conversion factor, but is much more expensive.

Fat

12. Can I use the sum of individual triglyceride, converted from individual fatty acid, for total fat?

Total fat normally refers to the sum of triglycerides, phospholipids, wax ester, sterols and minor amount of non-fatty material. These non-triglyceride components may play an important role in metabolism. Therefore, AOAC gravimetric methods are accepted for the determination of total fat.

13. What is saturated fat?

Saturated fat refers to the total of fatty acids containing no double bonds and commonly the sum of 13 saturated fatty acids including $C_{4:0}$, $C_{6:0}$, $C_{8:0}$, $C_{10:0}$, $C_{12:0}$, $C_{14:0}$, $C_{15:0}$, $C_{16:0}$, $C_{17:0}$, $C_{18:0}$, $C_{20:0}$, $C_{22:0}$, and $C_{24:0}$.

14. What is trans fat?

Trans fat is defined as the sum of all unsaturated fatty acids which contains at least one nonconjugated and trans double bond. More specifically, it means all the geometrical isomers of monounsaturated and polyunsaturated fatty acids having non-conjugated, interrupted by at least one methylene group, carbon-carbon double bonds in the trans configuration; and commonly refers to the sum of $C_{14:1T}$(9-trans), $C_{16:1T}$(9-trans), $C_{18:1T}$(total), $C_{18:2TT}$(9,12-trans), $C_{18:2T}$(9-cis, 12-trans), $C_{18:2T}$(9-trans, 12-cis), $C_{20:1T}$(11-trans) and $C_{22:1T}$(13-trans).

Dietary Fibre

15. Since "dietary fibre" is a method dependent test parameter, the change of the definition of dietary fibre would affect the labelling and claims significantly. Which AOAC official method should be used to determine the dietary fibre content?

According to the Amendment Regulation, any appropriate AOAC official method is acceptable. In general, CFS would use the AOAC official methods 985.29 and/or 2001.03 to measure the content of dietary fibre of a prepackaged food. If necessary, CFS would require the manufacturer, importer or vendor to provide the method used for follow up.

16. Can I use Englyst method to determine the dietary fibre content of a prepackaged food?

The Englyst method, which is not used world-wide, is complicated and may therefore be less suitable for routine analysis. Furthermore, Englyst method generally gives lower values than AOAC official method 985.29 or 2001.03. Therefore, the Administration only accepts AOAC official methods. In general, CFS would use the AOAC official methods 985.29 and/or 2001.03 to measure the content of

dietary fibre of a prepackaged food. If the result does not match with the labelled content, CFS would require the manufacturer, importer or vendor to provide the method used for further follow up.

17. Can I use AOAC official method 2001.03 to determine the content of dietary fibre? What is the difference between the AOAC official methods 985.29 and 2001.03?

The AOAC official method 985.29 or 991.43 determines the total dietary fibre - the sum of insoluble dietary fibre (IDF) and soluble dietary fibre (SDF) in foods. The total dietary fibre content is the sum of IDF and SDF with respect to AOAC official method 985.29. However, the AOAC official method 2001.03 determines the IDF, high molecular weight (HMW) SDF and low molecular weight resistant maltodextrin (LMWRMD) in foods. According to the AOAC official method 2001.03, the total dietary fibre is defined as the sum of IDF, HMWSDF and LMWRMD. Hence, the total dietary fibre results obtained by AOAC official methods 985.29 and 2001.03 may be different. The difference would depend on whether the food sample contains resistant maltodextrin or other carbohydrates polymers that give positive result on testing.

18. Would AOAC official method 985.29 underestimate the dietary fibre content when the prepackaged food product contains functional fibre?

In many countries, synthetically manufactured or naturally occurring isolated oligosaccharides and manufactured resistant starch that have beneficial physiological effects in humans are found in prepackaged food and serve as fibre. AOAC official method 985.29 is not suitable to test for these substances. Specific test methods are required for testing these carbohydrate polymers, including AOAC official method 997.08, 2001.03, 2000.11, etc. In summary, the Administration accepts a set of test methods, listed below, for the analysis of functional fibre -.

Functional fibre	Commercial name	Test Method
Beta-glucan	Imprime PGG®	AOAC 995.16
Oligofructose	Raftilose®, OliggoFiber™	AOAC 997.08 or 999.03
Fructooligosaccharides	Neosugar, Actilght®	AOAC 997.08 or 999.03
Polydextrose	Litesse®	AOAC 2000.11
Galactooligosaccharides	Yacult, Borculo Whey Products	AOAC 2001.02
Resistant maltodextrin	Fibersol-2	AOAC 2001.03
Resistant starch	C*Actistar	AOAC 2002.02

Carbohydrates (including sugars)

19. Why do I need to test for water and ash content of the food samples?

The available carbohydrate content of foods has, for many years, been calculated by difference, rather than analyzed directly. Under such approach, the relevant constituents in foods (protein, fat, water, alcohol, ash, dietary fibre) are determined individually, summed and subtracted from the total weight of the food. This is referred to as available carbohydrates by difference and is calculated by the following formula:

100 – (weight in grams [protein + fat + water + ash + alcohol(ethanol) + dietary fibre] in 100 g of food)

20. What is the difference between total carbohydrates and available carbohydrates?

Total carbohydrates refers to the sum of available carbohydrates and dietary fibre.

21. For some prepackaged food that contains indigestible material, such as chewing gum, can the carbohydrate content be calculated by difference?

If you get the content of the indigestible material in the prepackaged food, the calculation of available carbohydrates by difference still could be applied with the additional factor of indigestible material. Otherwise, the content of available carbohydrates could be calculated by the summation of the contents of starch and total available sugars, and if quantified or added to the food, any available oligosaccharides, glycogen and maltodextrins.

22. Do sugar alcohols belong to carbohydrates?

Sugar alcohol (also known as polyol) is a hydrogenated form of carbohydrates, whose carbonyl group (aldehyde or ketone) has been reduced to a primary or secondary hydroxyl group. In general, sugar alcohol is classified as a carbohydrates constituent.

23. How many monosaccharides and disaccharides should be tested for sugars?

According to international trend, fructose, galactose, glucose, lactose, maltose and sucrose are the commonly tested parameters.

24. Can I test reducing sugars instead of monosaccharides and disaccharides for sugars?

Sugars means all mono-saccharides and di-saccharides present in food. If the food sample contains one single form of reducing sugar, then the reducing sugar test result would be comparable to the result analyzed by high performance liquid chromatography. However, if the sample contains more

than one form of sugars, the reducing sugar test result could not truly reflect the content of sugars in the sample, as defined in the law.

Vitamins and Minerals

25. Does alpha-carotene belong to vitamin A?

Carotenoids with provitamin A activity include α-carotene, β-carotene, γ-carotene and β-cryptoxanthin. With reference to the Codex Guidelines, according to which the conversion factor is 6 μg β-carotene to 1 μg Retinol Equivalent (RE), the Amendment Regulation recognizes only beta-carotene, amongst the carotenoids, in the calculation of RE for vitamin A, and apply the same conversion factor. BS EN 12823:2000 Part 1 and 2 are appropriate methods for measuring retinol and β-carotene in foods respectively.

26. How many different forms of vitamin D are there in food?

Two common forms of vitamin D are found in foods, namely cholecalciferol (D_3) and ergocalciferol (D_2). Vitamin D_3 is more widely distributed (e.g. in fish oils, many fatty fish tissues, eggs, butter and cream cheese) and D_2 occurs naturally in low concentrations in fish oils and mushrooms. Some meats contain 25-hydroxy-cholecalciferol in concentrations that contribute to vitamin D activity and thus is considered as vitamin D as well. BS EN 12821:2000 could be used for measuring vitamin D in foods.

27. Is α-tocopherol equivalent to vitamin E?

Vitamin E activity is exhibited naturally by eight substances structurally based on tocopherols and tocotrienols. Each vitamer has a different vitamin activity compared with α-tocopherol, which is seen as the primary structure. The preferred analytical method is therefore the one that separates and measures all the different vitamers. BS EN 12822:2000 is a suitable method for measuring tocopherols in foods. According to FAO, α-tocopherol equivalents of mixed diet containing natural forms of vitamin E could be estimated as the sum of the number of milligrams of alpha-tocopherol, beta-tocopherol multiplied by 0.5, gamma-tocopherol multiplied by 0.1, delta-tocopherol multiplied by 0.01 and alpha-tocotrienol multiplied by 0.3.

28. Can erythorbic acid count as vitamin C?

There are two substances showing vitamin C activity, L-ascorbic acid and the first product of its oxidation – L-dehydroascorbic acid. The D-isomer (erythorbic acid), which is used as an antioxidant food additive, is not active. Hence, vitamin C refers to the sum of the number of milligrams of L-ascorbic acid and L-dehydroascorbic acid.

29. Does niacin equal to nicotinamide?

"Niacin" (Vitamin B_3) refers to nicotinamide, nicotinic acid, and derivatives that have biological activity of nicotinamide.

30. Can the content of folate in food be expressed in terms of Dietary Folate Equivalent (DFE)?

Since folic acid taken with food is 85 percent bio-available but food folate is only about 50 percent bio-available, folic acid taken with food is 85/50 (i.e., 1.7) times more available. Thus, when calculating the folic acid equivalents of mixed diet containing natural and synthetic forms of folic acid, it could be estimated as the sum of the number of micrograms of food folate and synthetic folic acid multiplied by 1.7 in the units of μg DFE.

31. Can I use other AOAC official method instead of AOAC official method 985.35 to determine the content of calcium and sodium in food?

For calcium analysis, it is well known that anionic chemical interferences, such as phosphate, sulfate and aluminum interferences, would be present if lanthanum is not used in samples and standards. Therefore, other methods that employ lanthanum to reduce the anionic chemical interferences would be suitable for analysis.

In the analysis of sodium by flame absorption spectrometry or inductively coupled plasma – optical emission spectrometry, sodium can experience partial ionization which indirectly affects absorption sensitivity. The presence of other alkali salts in the sample can reduce this ionization and thereby enhance analytical results. The ionization suppressive effect of sodium is small if the ratio of sodium to potassium is under 10. Any enhancement due to other alkali salts in food can be stabilized by adding excess cesium to both sample and standard solutions. As such, other methods that employ cesium to reduce the ionization suppressive effect would be suitable for the analysis of sodium. Furthermore, reagent blanks should be analyzed to correct for sodium impurities in the buffer stock.

Annex II

List of testing methods currently used by CFS for determining nutrient contents in indigenous mixed foods.

Nutrient	Method Reference	Technique
Fat (total)	AOAC 922.06	Acid hydrolysis followed by extraction
Total nitrogen	AOAC 928.08 or AOAC 992.15	Nitrogen by Kjeldahl or combustion method
Water	ISO 1442:1997	Gravimetric determination after dried at 105°C
Total ash	ISO 936:1998	Gravimetric determination after dried, carbonized and incinerated at 550°C
Saturated fatty acids and trans fatty acids	AOAC 996.06	Capillary gas chromatography using SP2560 100m x 0.25mm, 0.2μm film column
Sodium	AOAC 969.23 or AOAC 985.35	Acid digestion followed by ICP-OES
Calcium	AOAC 969.23 or AOAC 985.35	Acid digestion followed by ICP-OES
Cholesterol	AOAC 994.10	Direct saponification and capillary gas chromatography
Dietary fibre	AOAC 985.29	Gravimetric determination after defatting and enzymatic hydrolysis of protein and carbohydrates
Sugars (all monosaccharides and disaccharides)	AOAC 980.13 (modified HPLC column and mobile phase)	Aqueous food extraction followed by HPLC-RI

Note: For all AOAC Official Methods quoted in the above, please refer to AOAC Official Method, 18th Edition, Current Through Revision 2, 2007 AOAC INTERNATIONAL.

ISO refers to International Organization for Standardization.

HPLC-RI refers to high performance liquid chromatography – refractive index detection.

ICP-OES refers to inductively coupled plasma – optical emission spectrometry.

The CFS does not require other laboratories to use these testing methods.

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