

NOSB NATIONAL LIST FILE CHECKLIST

LIVESTOCK

MATERIAL NAME: #13 Oxytocin



NOSB Database Form



References



MSDS (or equivalent)



TAP Reviews from: William Zimmer, Marta Engel, and Lynn Brown

**NOSB/NATIONAL LIST
COMMENT FORM
LIVESTOCK**

Material Name: #13 Oxytocin

Please use this page to write down comments, questions, and your anticipated vote(s).

COMMENTS/QUESTIONS:

1. In my opinion, this material is:
_____ Synthetic _____ Non-synthetic.

2. This material should be placed on the proposed National List as:
_____ Prohibited Natural _____ Allowed Synthetic.

TAP REVIEWER COMMENT FORM for USDA/NOSB

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Complete both sides of page. Attach additional sheets if you wish.

This file is due back to us by: Sept 5, 1995

Name of Material: Oxytocin

Reviewer Name: William Zimmer D.V.M.

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

Synthetic

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (This material does not belong on National List)

Are there any use restrictions or limitations that should be placed on this material on the National List? Yes!

Can not be used to stimulate milk production. Can be used under prescription and dosage documentation on individual case basis for stimulation of milk letdown, uterine contractions, etc. ~~to aid in the treatment~~ of diseases such as mastitis, prolapsed uterus, etc.

In Accurate: FDA does not allow wide scale use of Oxytocin to boost/stimulate milk production!

Any additional comments? (attachments welcomed)

Due to potential for misuse by farmers, this compound should include veterinary prescription, use history and dosage documentation and should carry a 24 hour milk withdrawal

Do you have a commercial interest in this material? Yes; No

Signature William C. Zimmer D.V.M. Date 9-7-95

**Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)**

- (1) the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;

N/A

- (2) the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;

Contamination of milk and desensitization of animals given routine Oxytocin injections

- (3) the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;

N/A

- (4) the effect of the substance on human health;

unknown at levels likely to result from normal agriculture use. Exposure to high doses will cause uterine contractions and possible abortions in pregnant women.

- (5) the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;

N/A for soils and crops

Livestock - chemical desensitization from long term daily use

- (6) the alternatives to using the substance in terms of practices or other available materials; and

No alternatives for certain health cases. Homeopathic herbs and acupuncture may help other cases.

- (7) its compatibility with a system of sustainable agriculture.

Compatible

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This file is due back to us by: Sept 5, 1995

Name of Material: Oxytocin

Reviewer Name: MARTA W. ENGEL, D.V.M.

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

Synthetic

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (This material does not belong on National List)

Are there any use restrictions or limitations that should be placed on this material on the National List?

Should be restricted. Use only if necessary to allow heifer or cow to let milk down last few days of lactation or for a day or two during episode of acute mastitis.

Please comment on the accuracy of the information in the file: *OK But Not long term.*

Any additional comments? (attachments welcomed)

Has been used by dairy producers to supposedly ↑ milk production. Also some producers have had cows addicted to it, that need it on a daily basis to let there milk down. These cows should be culled.

Do you have a commercial interest in this material? Yes; No

Signature Marta W Engel DVM Date 9/11/95

**Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)**

- (1) the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;

None

- (2) the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;

Not likely

- (3) the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;

I don't know about the manufacturing process

- (4) the effect of the substance on human health;

*Only small amounts are being used
2 or 3 ~~ml~~ intramuscularly or subcutaneously.
Not likely to be a problem*

- (5) the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;

*Not very much will get into the soil & crop
System if only small amounts are used sporadically.
I don't think it should be used long term in livestock.*

- (6) the alternatives to using the substance in terms of practices or other available materials; and

*There are some alternatives, but
they are not well known or well-explored.*

- (7) its compatibility with a system of sustainable agriculture.

OK on a limited basis

TAP REVIEWER COMMENT FORM for USDA/NOSB

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This file is due back to us by: Sept 5, 1995

Name of Material: Oxytocin

Reviewer Name: Lynn Brown

Is this substance Synthetic or non-synthetic? Explain (if appropriate)

Synthetic

If synthetic, how is the material made? (please answer here if our database form is blank)

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, Non-synthetic (This material does not belong on National List)

Are there any use restrictions or limitations that should be placed on this material on the National List?

No

Please comment on the accuracy of the information in the file:

Information is accurate

Any additional comments? (attachments welcomed)

Do you have a commercial interest in this material? Yes; No

Signature Lynn K Brown Date 5/31/95

**Please address the 7 criteria in the Organic Foods Production Act:
(comment in those areas you feel are applicable)**

- (1) **the potential of such substances for detrimental chemical interactions with other materials used in organic farming systems;**

None

- (2) **the toxicity and mode of action of the substance and of its breakdown products or any contaminants, and their persistence and areas of concentration in the environment;**

None

- (3) **the probability of environmental contamination during manufacture, use, misuse or disposal of such substance;**

None

- (4) **the effect of the substance on human health;**

Proper use in livestock production will have no effect on human health.

- (5) **the effects of the substance on biological and chemical interactions in the agroecosystem, including the physiological effects of the substance on soil organisms (including the salt index and solubility of the soil), crops and livestock;**

None

- (6) **the alternatives to using the substance in terms of practices or other available materials; and**

I know of no substance that will replace oxytocin to induce uterine contractions and milk let down.

- (7) **its compatibility with a system of sustainable agriculture.**

Oxytocin use is compatible with sustainable agriculture.

Identification

Common Name	Oxytocin	Chemical Name	
Other Names	Alpha-hypophamine, Endopituitrina, Pitocin, Syntocinon		
Code #: CAS		Code #: Other	
N. L. Category	Synthetic Allowed	MSDS	No

Chemistry

Family complete peptide

Composition Hormone secreted by the posterior pituitary gland and the *corpus luteum*. $C_{43}H_{66}N_{12}O_{12}S_2$. Contains the amino acid sequence: Cys-Tyr-Ile-Gln-Asn-Cys-Pro-Leu-GlyNH₂

Properties White powder, soluble in water and butanol. Oxytocin from beef and hog sources shows no differences in amino acid composition.

How Made

A long and complex synthetic process, starting with dicyclohexyl carbodiimide and α -benzyl-L-aspartic acid- β -lower alkyl ester in methylene chloride. After 18 steps involving such compounds as triethylamine, alcoholic alkali metal hydroxide, ether, diethylamine, more dicyclohexyl carbodiimide, and other solvents, the purified form is obtained. (the complete process is on file)

Use/Action

Type of Use Livestock

Use(s) Health care. Can be used to stimulate milk production. Can also be used to prevent retained placentas.

Action Actuates the 'milk let-down' mechanism and stimulates contraction of the muscles of the uterus.

Combinations

Status

OFPA

N. L. Restriction Category 2

EPA, FDA, etc A New Animal Drug for which several NADAs have been approved for animals.

Safety Guidelines

Directions

Registration

State Differences

Historical status

International status

OFPA Criteria

2119(m)1: chemical interactions

2119(m)2: toxicity & persistence

2119(m)3: manufacture & disposal consequences

2119(m)4: effect on human health

2119(m)5: agroecosystem biology

2119(m)6: alternatives to substance

2119(m)7: Is it compatible?

References

Black's Veterinary Dictionary, 16th edition, 1988. Geoffrey P. West ed.; Barnes and Noble Books, Totoway, NJ

The Merck Index, 10th edition, 1983. Merck and Co., Inc., Rahway NJ

Velluz, L. et al.; U.S. Patent 2,938,891; May 31, 1960; assigned to Uclaf, France.

See also attached.

OXYTOCIN REFERENCES

AU: Lefcourt,-A.M.; Akers,-R.M.

TI: Teat stimulation-induced oxytocin and catecholamine release in pregnant and lactating Holstein heifers.

SO: Domest-Anim-Endocrinol. Stoneham, Mass. : Butterworth-Heinemann. Apr 1991. v. 8 (2) p. 235-243.

CN: DNAL QL868.D6

AU: McDonald,-L.E.

TI: Hormones affecting reproduction.

SO: Veterinary pharmacology and therapeutics / edited by Nicholas H. Booth, Leslie E. McDonald. 6th ed. Ames, Iowa : Iowa State University Press, 1988. p. 593-615. ill.

CN: DNAL SF915.J6-1988

AU: Thun,-R

TI: Oxytocin: action and clinical application. [Oxytocin, parturition induction, livestock]

SO: Ill-Vet, Oct 1974, 17 (10): 9-12. Ref.

CN: DNAL 41.8-IL62

AU: Prosser,-C.G.; Davis,-S.R.

TI: Milking frequency alters the milk yield and mammary blood flow response to intra-mammary infusion of insulin-like growth factor-I in the goat.

SO: J-Endocrinol. Bristol : The Journal. Nov 1992. v. 135 (2) p. 311-316.

CN: DNAL 448.8-J8293

AB: The milk yield and mammary blood flow responses to close-arterial, intra-mammary infusion of IGF-I were investigated in five Saanen goats milked frequently or normally the day before. Animals were infused for 6 h with recombinant human IGF-I (1.3 nmol/min) and milked hourly following i.v. injection of oxytocin beginning 2 h before infusion and then every 2 h. Thus, more frequent milk removal on the day before close-arterial infusion of IGF-I attenuated both the milk yield and mammary blood-flow response to the infusion of IGF-I.

AU: Nostrand,-S.D.; Galton,-D.M.; Erb,-H.N.; Bauman,-D.E.

TI: Effects of daily exogenous oxytocin on lactation milk yield and composition.

SO: J-Dairy-Sci. Champaign, Ill. : American Dairy Science Association. July 1991. v. 74 (7) p. 2119-2127.

CN: DNAL 44.8-J822

AB: Eighty-four Holstein cows were used to determine effects of exogenous oxytocin on 305-d milk production and health. Cows were assigned at parturition by parity group to treatments: 1) oxytocin group, animals received an injection of 1 ml (20 IU) of oxytocin at each milking throughout lactation and 2) control group, animals received no injection. The oxytocin group produced 849 kg more milk during the lactation than the control group, with a significant difference occurring after peak milk yield. This suggests that exogenous oxytocin maintained greater persistency during lactation. No significant differences existed for milk fat or protein percentages. The use of exogenous oxytocin at milking increased lactation milk production with no apparent effect on health.

AU: Vighio,-G.H.; Liptrap,-R.M.; Etherington,-W.G.

TI: Oxytocin-prostaglandin interrelationships in the cow with pyometra.

SO: Theriogenology. Stoneham, Mass. : Butterworth-Heinemann. June 1991. v. 35 (6) p. 1121-1129.

CN: DNAL QP251.A1T5

AB: Ovarian steroids, luteal oxytocin and uterine prostaglandin F2 alpha (PGF2 alpha) interact to regulate luteolysis in the cow. Since persistent corpora lutea are characteristic in cows with pyometra, the positive feedback, relationship between oxytocin and PGF2 alpha was examined in normal animals and in cows with clinical cases of pyometra. The persistence of corpora lutea in cows with pyometra is not due to an insufficiency in the synthesis of uterine PGF2 alpha, but may be associated with inadequate secretion of ovarian oxytocin.

AU: Raman,-S-R-P

TI: Effect of continual injection of oxytocin on production and reproduction in milch animals
SO: Prog-Farming, Oct 1977, 14 (2): 21.
CN: DNAL S19.P7

AU: Howard,-H.J.; Morbeck,-D.E.; Britt,-J.H.
TI: Extension of oestrous cycles and prolonged secretion of progesterone in non-pregnant cattle infused continuously with oxytocin.
SO: J-Reprod-Fertil. Colchester : The Journal. Nov 1990. v. 90 (2) p. 493-502.
CN: DNAL 442.8-J8222

TI: Dairies try to sidestep bST boycott with oxytocin use.
SO: Nutr-Week. Washington, D.C. : Community Nutrition Institute. Oct 26, 1990. v. 20 (42) p. 6.
CN: DNAL TX341.C6

AU: Kotwica,-J.; Schams,-D.; Meyer,-H.H.D.; Mittermeier,-T.
TI: Effect of continuous infusion of oxytocin on length of the oestrous cycle and luteolysis in cattle.
SO: J-Reprod-Fertil. Colchester : Journal of Reproduction and Fertility. May 1988. v. 83 (1) p. 287-294.
CN: DNAL 442.8-J8222

AU: Wachs,-E.A.; Gorewit,-R.C.; Currie,-W.B.
TI: Oxytocin concentrations of cattle in response to milking stimuli through lactation and mammary involution. II. [Holstein cows].
SO: Domest-Anim-Endocrinol. Auburn, Ala. : Dept. of Physiology and Pharmacology, School of Veterinary Medicine, Auburn Univ. Apr 1984. v. 1 (2) p. 141-154. ill.
CN: DNAL QL868.D6

AU: Wilks,-J-W; Hansel,-W
TI: Oxytocin and the secretion of luteinizing hormone in cattle
SO: J-Anim-Sci, Nov 1971, 33 (5): 1048-1052. Ref.
CN: DNAL 49-J82

AU: Al-Eknaah,-M.M.; Homeida,-A.M.; Galil,-A.K.A.; Elbashir,-A.E.
TI: Oxytocin-induced biochemical changes in cervical mucus of the goat.
SO: Theriogenology. Stoneham, Mass. : Butterworth-Heinemann. July 1991. v. 36 (1) p. 143-148.
CN: DNAL QP251.A1T5
AB: This study was conducted to investigate the effects of oxytocin administration on plasma progesterone concentration and cervical mucus content of protein and acid and alkaline phosphatase activity in the goat. It is suggested that oxytocin-induced changes are mediated via the production and release of prostaglandin F2-alpha (PGF2-alpha).

AU: Shimada,-K.; Saito,-N.
TI: Control of oviposition in poultry.
SO: Crit-Rev-Poult-Biol. New York, N.Y. : Elsevier Science Publishing Co. 1989. v. 2 (3) p. 235-253.
CN: DNAL QL698.C7

AU: Sernia,-C.; Gemmell,-R.T.; Thomas,-W.G.
TI: Effect of intra-ovarian infusion of oxytocin on plasma progesterone concentrations in pregnant ewes.
SO: J-Reprod-Fertil. Colchester : The Journal. July 1991. v. 92 (2) p. 453-460.
CN: DNAL 442.8-J8222

AU: Wathes,-D.C.; Ayad,-V.J.; Gilbert,-C.L.; McGoff,-S.A.; Wathes,-C.M.
TI: Influence of oxytocin infusion during oestrus and the early luteal phase on progesterone secretion and the establishment of pregnancy in ewes.
SO: J-Reprod-Fertil. Colchester : The Journal. July 1991. v. 92 (2) p. 383-391.
CN: DNAL 442.8-J8222

AU: Mayer,-H.; Bruckmaier,-R.; Schams,-D.

TI: Lactational changes in oxytocin release, intramammary pressure and milking characteristics in dairy cows.

SO: J-Dairy-Res. Cambridge : Cambridge University Press. May 1991. v. 58 (2) p. 159-169.

CN: DNAL 44.8-J823

AU: Varner,-D.D.; Blanchard,-T.L.; Brinsko,-S.P.

TI: Estrogens, oxytocin and ergot alkaloids--uses in reproductive management of mares.

SO: Proc-Annu-Conv-Am-Assoc-Equine-Pract. Manhattan, Kan. : The Association. 1989. (34th) p. 219-241.

CN: DNAL SF601.A46

AU: Allen,-J.C.

TI: Milk synthesis and secretion rates in cows with milk composition changed by oxytocin.

SO: J-Dairy-Sci. Champaign, Ill. : American Dairy Science Association. Apr 1990. v. 73 (4) p. 975-984.

CN: DNAL 44.8-J822

AU: Sauber,-C.M.

TI: The oxytocin controversy.

SO: Dairy-Herd-Manage. Minnetonka, Minn. : Miller Publishing Co. May 1990. v. 27 (5) p. 18-20, 24.

CN: DNAL SF191.D3

AU: Flint,-A.P.F.; Sheldrick,-E.L.; Jones,-D.S.C.; Auletta,-F.J.

TI: Adaptations to pregnancy in the interactions between luteal oxytocin and the uterus in ruminants.

SO: J-Reprod-Fertil. Colchester : The Journal. 1989. v. 37 (suppl.) p. 195-204.

CN: DNAL 442.8-J8222

AU: Stewart,-R.E.; Stevenson,-J.S.

TI: Hormonal, estrual, ovulatory and milk traits in postpartum dairy cows following multiple daily injections of oxytocin.

SO: J-Anim-Sci. Champaign, Ill. : American Society of Animal Science. Dec 1987. v. 65 (6) p. 1585-1594.

CN: DNAL 49-J82

AU: Pugh,-D.G.

TI: Four practical uses for oxytocin in mares.

SO: Vet-Med. Lenexa, Kan. : Veterinary Medicine Publishing Co. May 1987. v. 82 (5) p. 542, 546-547.

CN: DNAL 41.8-M69

AU: Miller,-B.J.; Lodge,-J.R.

TI: Postpartum oxytocin treatment for prevention of retained placentas.

SO: Theriogenology. Los Altos, Calif. : Geron-X. Oct 1984. v. 22 (4) p. 385-388.

CN: DNAL QP251.A1T5

AU: Hickey,-G.J.; White,-M.E.; Wickenden,-R.P.; Armstrong,-D.A.

TI: Effect of oxytocin on placental retention following dystocia [Cows].

SO: Vet-Rec. London : British Veterinary Association. Feb 25, 1984. v. 114 (8) p. 189-190.

CN: DNAL 41.8-V641

AU: Gorewit,-R.C.; Wachs,-E.A.; Sagi,-R.; Merrill,-W.G.

TI: Current concepts on the role of oxytocin in milk ejection [Cows].

SO: J-Dairy-Sci. Champaign : American Dairy Science Association. Oct 1983. v. 66 (10) p. 2236-2250. ill.

CN: DNAL 44.8-J822

